PB-217 608

TRANSCRIPT OF HEARING: POLLUTION OF INTERSTATE WATERS. MISSOURI RIVER AND CONNECTING OR TRIBUTARY WATERS IN OR ADJACENT TO THE KANSAS CITYS METROPOLITAN AREA

Public Health Service
Kansas City, Missouri

1960

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OR ADJACENT TO THE KANSAS CITYS
METROPOLITAN AREA

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service

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KANSAS CITY, MISSOURI
JUNE 13-17, 1960

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HEARING AT KANSAS CITY, MISSOURI CONCERNING POLLUTION OF THE INTERSTATE WATERS OF MISSOURI RIVER-TURKEY CREEK SEWER
KANSAS CITIES METROPOLITAN AREA

Pursuant to notice, this hearing convened at 9 a.m. on Monday, June 13, 1960, in the Appeals Courtroom, 6th Floor, U. S. Courthouse, 811 Grand Avenue, Kansas City, Missouri, before a six-man Board.

MEMBERS OF THE BOARD:

Mr. Chester S. Wilson, of Stillwater, Minnesota, (Chairman);
Mr. Freeman R. Johnson, of Joplin, Missouri, representing Missouri;
Mr. Blucher A. Poole, of Indianapolis, Indiana;
Mr. William C. Salome, of Topeka, Kansas, representing Kansas;
Mr. Sylvester E. Ridge, of Washington, D. C., representing the U. S. Department of Commerce;
Mr. John S. Samson, of Omaha, Nebraska,
Mr. Robert Ayers, Secretary to the Board.

APPEARANCES

For the Government:

Mr. Murray A. Stein, Washington, D. C.
Mr. Sidney Edelman, Washington, D. C.
Mr. Glen J. Hopkins, Kansas City, Missouri.

For the City of Kansas City, Missouri:

Mr. Richard H. Koenigsdorf, City Counselor
Mr. Benjamin M. Powers, Associate City Counselor

For the City of Kansas City, Kansas:

Mr. C. W. Brenneisen, Jr., City Attorney
Mr. Paul F. Mitchum, Mayor
Mr. Carl Hodgkinson

- - -

CHAIRMAN WILSON: The hearing will be in order.

This is a hearing on the pollution of the interstate waters of the Missouri and Kansas Rivers held upon order of the Secretary of Health, Education, and Welfare, the Honorable Arthur S. Flemming, and pursuant to due notice of the hearing given under the Federal Water Pollution Act and regulations.

The first order of business will be the reading of the notice of the hearing by the Secretary. It has been suggested that in view of the fact that this notice has been served upon all parties concerned and the reading of it takes considerable time, that the reading of the notice be dispensed with. That can be done only if there is no objection on the part of any interested party.

Do all parties here present consent to the dispensing with the reading of the notice and waiving the reading of the notice of hearing?

If I hear no objections, the reading of the notice of the hearing will be dispensed with.

(Which said notice reads as follows:)

Department of Health, Education, and Welfare, Public Health Service, Water Pollution Control: Interstate Waters of Missouri River-Turkey Creek Sewer, Kansas Cities Metropolitan Area.

Notice of Public Hearing

Whereas, on the basis of reports, surveys, and studies, the Surgeon General, having reason to believe that discharges of untreated or inadequately treated sewage and industrial wastes from the cities of Kansas City, Kansas, Kansas City, Missouri, and North Kansas City, Missouri, and industries associated therewith, cause or contribute to pollution subject to abatement under the Federal Water Pollution Control Act (70 Stat. 504, 33 U.S.C. 466g), called a conference pursuant to Section 8 of said Act, with respect to the pollution of the interstate waters of the Missouri River in the Kansas Cities Metropolitan Area; and,

Whereas, such conference was held on December 3, 1957, at Kansas City, Missouri; and,

Whereas the conferees representing the official State water pollution control agencies of the States of Missouri and Kansas and the Surgeon General of the Public Health Service unanimously agreed:

1. That pollution of interstate waters subject to abatement under the Federal Water Pollution Control Act is occurring in the Kansas and Missouri Rivers-Kansas Cities Metropolitan Area. The major sources of such pollution are untreated and inadequately treated sewage and industrial wastes from Kansas City, Kansas, Kansas City, Missouri, and North Kansas City, Missouri, and local industrial establishments finding their way into the waters of the Missouri River (an interstate water as defined by the Federal Act) and tributary streams in the Kansas Cities Metropolitan Area;

2. That the effects of this pollution are: (1) deterioration of water quality for public water supply at Lexington, Boonville, Jefferson City, Glasgow, St. Charles, St. Louis City, and St. Louis County, Missouri, with associated enhancement of possible disease transmission; (2) increased concentrations of coliform and other organisms associated with human diseases which constitute a health hazard to commercial and recreational users of the river; (3) deterioration of water quality so as to prevent the full use of the river as a commercial fishery; (4) deterioration of water quality so as to prevent the use of the river for sport fishing; (5) impairment of water quality so as to interfere with navigation; (6) impairment of water quality so as to interfere with actual and potential use of the river for many industrial uses; (7) interference with water quality so as to degrade the Missouri River Area below the Kansas City Metropolitan Area as a wildfowl habitat; (8) deterioration of water quality to the extent that severe sight and odor nuisances have been created resulting in serious impairment of the river as a recreational area specifically preventing the use of various river front sites for recreational areas and parks.

3. That the measures presently used for disposal of sewage and industrial wastes from Kansas City, Kansas, Kansas City, Missouri, North Kansas City, Missouri, and associated industries are not adequate to secure abatement of pollution of the Missouri River;

4. That the delays encountered in the abatement of such pollution are due to the lack of installation of adequate waste treatment facilities or other methods for reduction of pollution by the municipalities and industries concerned;

5. That Kansas City, Kansas, Kansas City, Missouri, North Kansas City, Missouri, and associated industries should provide adequate treatment for wastes prior to their discharge;

6. That industries in the Kansas Cities Metropolitan Area should either discharge their wastes to a municipal waste collection and treatment system or provide adequate treatment for their wastes;

7. That basic engineering and feasibility reports for adequate treatment facilities be completed by Kansas City, Missouri, not later than March 1, 1958; cognizance is taken of the fact that Kansas City, Kansas, and North Kansas City, Missouri, already have done this.

8. That acceptance and revision of basic engineering and feasibility reports for adequate waste treatment facilities be completed by city officials of Kansas City, Missouri, and North Kansas City, Missouri, not later than September 1, 1958; cognizance is taken of the fact that Kansas City, Kansas, already has done this;

9. That the cities of Kansas City, Missouri, North Kansas City, Missouri, and Kansas City, Kansas complete all necessary financial arrangements not later than September 1, 1959. The conferees strongly urge, however, that the mayors and other city officials of these three cities explore the feasibility of putting the bond

issue before the voters at an earlier date, preferably not later than January 1, 1959;

10. That the first construction contracts for these waste treatment facilities be let by Kansas City, Kansas, and Kansas City, Missouri, not later than January 1, 1960, by North Kansas City, Missouri, not later than June 1, 1960, with the understanding that the city officials of North Kansas City, Missouri, explore the feasibility of letting their first contract earlier so that it may coincide with the schedule of the other two cities;

11. That the balance of the construction contracts for these remedial works be let by Kansas City, Kansas, and Kansas City, Missouri, not later than March 1, 1960, and by North Kansas City, Missouri, not later than September 1, 1960, with the understanding that city officials of North Kansas City, Missouri, explore the feasibility of letting their contracts earlier so they will coincide with the schedule of the other two cities.

12. That adequate waste treatment facilities for Kansas City, Kansas, Kansas City, Missouri, and North Kansas City, Missouri, be completed and in operation by March 1, 1962, with the understanding that the complete separation of storm and sanitary sewage from Kansas City, Kansas, may not be effectuated until January 1, 1963;

13. That industry in the Kansas Cities Metropolitan Area either connect with a municipal waste disposal system or complete and put into operation adequate treatment works for disposal of domestic and industrial wastes not later than March 1, 1962, but that all efforts be made to secure earlier treatment;

14. That industry is to give the appropriate municipality ample notification before the municipality places the question of financing before its voters as to whether such industries are going to join the municipal waste disposal systems; and,

Whereas, the Surgeon General of the Public Health Service on January 31, 1958, recommended to the Missouri Department of Public Health and Welfare and to the Kansas State Board of Health, that they take appropriate steps under their State water pollution control programs to insure that contributors to such pollution within their jurisdiction take steps to meet the time schedule for remedial action unanimously agreed upon by the conferees;

Whereas, although cognizance is taken of compliance with schedules of corrective action for Kansas City, Kansas, and the Fairfax Drainage District, Kansas, as approved by the Kansas State Board of Health, I find that pollution in the Kansas Cities Metropolitan Area is so complex and commingled that the recommendation of reasonable and equitable measures to abate such pollution requires consideration of action of all parties named in this notice and the coordination thereof, and I further find that the remedial action recommended by the Surgeon General, described above, or action reasonably calculated to secure abatement of such pollution has not been taken;

Now therefore, pursuant to Section 8(e) of the Federal Water Pollution Control Act (70 Stat. 505, 33 U.S.C. 466g(e)) I hereby call a public hearing to begin at 9 a.m. CST on June 13, 1960, at the Appeals Courtroom, 6th Floor, U. S. Courthouse, 811 Grand Avenue, Kansas City, Missouri, before a Hearing Board composed of the following named persons:

Mr. Chester S. Wilson, Chairman;

Mr. William C. Salome, representing the State of Kansas;

Mr. James W. Bibb, alternate to Mr. William C. Salome;

Mr. Freeman R. Johnson, representing the State of Missouri;

Mr. Sylvester E. Ridge, representing the U. S. Department of Commerce;

Mr. Blucher A. Poole;

Mr. John S. Samson.

On the basis of the evidence presented at such hearing, the Board shall make findings as to whether the cities of Kansas City, Kansas, Kansas City, Missouri, the industrial establishments located in and adjacent to these cities, and other persons named below are causing or contributing to pollution of interstate waters which endangers the health or welfare of persons in a State other than that in which the discharges originate, by discharges into or reaching the Kansas River, Turkey Creek Sewer, or the Missouri River, and whether, if it so finds, effective progress towards abatement thereof is being made. If said Board finds that such pollution is occurring and effective progress towards abatement is not being made, said Board shall make its recommendations to me concerning the measures, if any, which it finds reasonable and equitable to secure abatement of such pollution.

Notice of such public hearing is hereby given to the following:

Missouri Department of Public Health and Welfare, Jefferson City, Missouri;

Kansas State Board of Health, State Capitol Building, Topeka, Kansas;

City of Kansas City, Missouri;

City of Kansas City, Kansas;

Fairfax Drainage District of Kansas;

Kaw Valley Drainage District of Kansas;

Kansas City Stockyards Company, Livestock Exchange Building, 1600 Genessee Street, Kansas City, Missouri;

Missouri Valley Serum Company, 50 North 2nd Street, Kansas City, Kansas;

National Cylinder Gas Company, 1614 State Avenue, Kansas City, Kansas;

The National Laboratories Corporation, 1721 Baltimore Avenue, Kansas City, Missouri;

Phillips Petroleum Company, 2029 Fairfax Trafficway, Kansas City, Kansas;

Procter and Gamble Manufacturing Company, 1900 Kansas Avenue, Kansas City, Kansas;

Atchison, Topeka, and Santa Fe Railroad Company, Fairfax Building, Kansas City, Missouri;

Sinclair Refining Company, 906 Grand Avenue, Kansas City, Missouri;

Swift and Company, 10 Berger Avenue, Kansas City, Kansas;

Midwest Cold Storage and Ice Corporation, 1101 South 5th Street, Kansas City, Kansas;

Buick, Oldsmobile, and Pontiac Assembly Plant, 100 Kindleberger Road, Kansas City, Kansas.

The following persons discharging matter causing or contributing to the pollution of the Missouri River which, on the basis of reports, surveys and studies, the Surgeon General at this time does not have reason to believe endangers the health or welfare of persons in a State other than that in which the discharge originates are notified that the Board may consider and evaluate such discharges in connection with its findings whether discharges from the persons named above constitute pollution subject to abatement under the Federal Act:

Corn Products Refining Company, 1001 Bedford Avenue, North Kansas City, Missouri;

Metallurgical, Incorporated, 1727 Manchester Trafficway, Kansas City, Missouri;

American Wiper and Waste Mills, 800 West 4th Street, Kansas City, Missouri;

Kansas City Power and Light Company, 1330 Baltimore Avenue, Kansas City, Missouri;

American Asphalt Roofing Company, 7600 Truman Road, Kansas City, Missouri;

American Creosoting Company, 2300 Oakland Street, Kansas City, Missouri;

Black, Sivalls and Bryson, Incorporated, 7500 East 12th Street, Kansas City 26, Missouri;

City of North Kansas City, Missouri;

Chevrolet Assembly Plant, Chevrolet-Kansas Division of General Motors Corporation, 6801 East 37th Street, Kansas City, Missouri;

Ford Motor Assembly Plant, Claycomo, Missouri;

Fisher Body Division-Kansas City Plant, General Motors Corporation, 6817 East 37th Street, Kansas City, Missouri;

Koppers Company, Wood Preserving Division, 31st Street at Kansas City Southern Tracks (Leeds), Kansas City, Missouri;

The Schenley Distillers, Incorporated, 2100 East Front Street, Kansas City, Missouri;

Sheffield Steel Division, Armco Steel Corporation, Sheffield Station, Kansas City, Missouri;

Union Wire Rope Corporation, 2100 Manchester Trafficway, Kansas City, Missouri;

The Vendo Company, 7400 East 12th Street, Kansas City, Missouri;

Westinghouse Electric Corporation, Aviation Gas Turbine Division, Kansas City Works, Bannister Road and Troost Avenue, Kansas City, Missouri;

Bendix Aviation Corporation, Kansas City Division, 95th Street and Troost Avenue, Kansas City, Missouri;

Prier Brass Manufacturing Company, 7801 Truman Road, Kansas City, Missouri;

The Ruberoid Company, 7600 Truman Road, Kansas City, Missouri.

Dated May 17, 1960. Arthur S. Flemming, Secretary of Health, Education, and Welfare.

CHAIRMAN WILSON: The next order of business will be the introduction of the members of this Board appointed by the Secretary of Health, Education, and Welfare. I will introduce them from right to left.

On my right of the table is Mr. Freeman R. Johnson, of Joplin, Missouri, the Vice-Chairman of the Water Pollution Control Board.

Next is Mr. Blucher A. Poole, Technical Secretary of the Stream Pollution Control Board of the Indiana Department of Health, of Indianapolis, Indiana.

On my extreme left is Mr. William C. Salome, Director of the Department of Administration of the State of Kansas, from the State of Kansas, representing that state.

Mr. Johnson, I should say, represents the State of Missouri. It is required under the regulations and the Federal Act that each of the states concerned have a representative on this Board.

Next on my left is Mr. Sylvester E. Ridge, of the United States Department of Commerce, of Washington, D. C. It is also required that there be a representative of that department on the Board.

And next is Mr. John S. Samson, on my immediate left, the Chairman of the Nebraska Water Pollution Control Council.

And I am Chester S. Wilson, a lawyer of Stillwater, Minnesota, and formerly Chairman of the Minnesota Water Pollution Control Commission, Chairman of the Board.

We will now ask for appearances in behalf of all interested parties. First what appearances are there by the Surgeon General or any other agency of the federal government?

MR. STEIN: I wish to enter an appearance for the Surgeon General of the Public Health Service of the United States. My name is Murray Stein, Chief of Interstate Enforcement.

I also enter an appearance for Mr. Sidney Edelman, Office of the General Counsel, Department of Health, Education and Welfare, and Mr. Glen J. Hopkins, Regional Engineer, with headquarters in Kansas City, Missouri, as technical advisor.

CHAIRMAN WILSON: Are there appearances by any other agencies of the federal government?

Appearances by state agencies. First the State of Missouri. If the Board member from Missouri has any appearances to call attention to, this would be the proper time. Are there any?

MR. JOHNSON: Oh, yes, excuse me. Yes, Mr. Chairman, here is Jack K. Smith.

MR. JACK SMITH: Jack Smith.

CHAIRMAN WILSON: Please give his name to the Secretary.

MR. JOHNSON: Jack K. Smith, Executive Secretary of the Missouri Water Pollution Board.

CHAIRMAN WILSON: Any other appearances for the State of Missouri?

The State of Kansas.

MR. METZLER: Dwight Metzler, Chief Engineer of the Kansas State Board of Health.

CHAIRMAN WILSON: Now are there any other appearances by any state agencies concerned?

Then we will note the appearances of the parties listed in the notice as being responsible for pollution. Any of the municipalities or other public agencies concerned first; the appearances of private corporations and individuals will be taken later.

We have here a list of those who are designated in the notice as being responsible for pollution. They, of course, know who they are and if they wish to record their appearances at this time, they will be noted. Are there any such appearances?

MR. SHARP: Clifford Sharp, Consulting Engineer, Fairfax Drainage District.

MR. WHITE: R. D. White, President of the Kaw Valley Drainage Board.

CHAIRMAN WILSON: It has been suggested that in order to save time I read the list of those who have been designated in the notice as responsible parties and see whether any of them is represented here. We have already had appearances by the two states.

The City of Kansas City, Missouri. Is there any appearance in behalf of the City of Kansas City, Missouri?

MR. KOENIGSDORF: My name is Richard H. Koenigsdorf. I am City Counselor of Kansas City, Missouri, and I have associated with me as counsel Mr. Benjamin M. Powers, Associate City Counselor.

CHAIRMAN WILSON: The City of Kansas City, Kansas.

MR. BRENNEISEN: I am C. W. Brenneisen, Jr., City Attorney of Kansas City, Kansas, and Mayor Paul F. Mitchum is here also and Joseph P. Regan, Commissioner of Boulevards, Parks and Streets, and Earl B. Swarner, Commissioner of Finance, Health and Public Property. And we also have with us Carl Hodgkinson and Truman Schlup, Consulting Engineers of the firm of Truman Schlup Consulting Engineers.

I might say to the Chairman at this time that we have four exhibits we will wish to introduce and if it would help the staff any, we would be glad to introduce them at this time. They are documents concerning engineering reports and sewer service charge studies and water pollution ordinance.

CHAIRMAN WILSON: The introduction of those exhibits should be deferred until we open the taking of evidence, but you may introduce them at the proper time.

MR. KOENIGSDORF: Mr. Chairman, I assume that this is going to be informal as far as receiving appearances. Kansas City, Missouri, desires to object to the jurisdiction of this Commission. I am withholding any objection until we proceed beyond this point.

CHAIRMAN WILSON: There will be an opportunity for making any such statement after the appearances have been noted. We are simply taking appearances now.

MR. KOENIGSDORF: Thank you very much.

CHAIRMAN WILSON: And any party is privileged to qualify its appearance at the proper time.

The Fairfax Drainage District of Kansas. Any appearance in behalf of that district?

MR. SHARP: Yes, sir. I gave my name earlier, sir. My name is Sharp, Consulting Engineer for the district. Mr. Steenhof, the President of the Board, is here. Mr. Stanley, the attorney for the Board, is here.

CHAIRMAN WILSON: The Kaw Valley Drainage District of Kansas.

MR. WHITE: R. D. White. Also our engineer, I think, is here, Mr. Schlup.

CHAIRMAN WILSON: Now are there any other municipalities, drainage districts or other public agencies who desire to enter appearances?

If not, we will take the appearances of private individuals and corporations concerned. First those designated in the notice as responsible for pollution.

The Kansas City Stockyards Company.

MR. DILLINGHAM: They will put in an appearance by their president, Jay B. Dillingham. May I inquire at this time as to the possible time you will take our testimony?

CHAIRMAN WILSON: Very well.

MR. DILLINGHAM: Will it be Thursday or Friday?

CHAIRMAN WILSON: That would depend upon the presentation of the main case of the government and any of the public agencies concerned. I will make an announcement later as to the order of the testimony and you will probably have to consult with the counsel for the public agencies, the government and the states and the municipalities--

MR. DILLINGHAM: It won't be today or tomorrow?

CHAIRMAN WILSON: --as to when the taking of the testimony in behalf of your concern would be reached.

MR. DILLINGHAM: Thank you very much.

CHAIRMAN WILSON: It is very difficult at this time to tell just when any particular stage in these proceedings will be reached, because we can't tell how much time is going to be taken by examination and cross-examination. I think you will have to wait until a little later in the proceedings and then perhaps you can conclude about when your turn will be reached. It is altogether probable that this hearing is going to take two or three days or maybe the whole week, but as to when any particular party is going to be reached it is impossible to say at this time.

The Missouri Valley Serum Company.

MR. KENNEDY: J. L. Kennedy representing Missouri Valley Serum Company.

CHAIRMAN WILSON: The National Cylinder Gas Company.

MR. ROPER: L. J. Roper, District Manager.

CHAIRMAN WILSON: The National Laboratories Corporation.

I might say that if there are any parties not represented at the opening of the hearing, they may register their appearance with the Secretary later.

There is no one here, then, for The National Laboratories Corporation.

The Phillips Petroleum Company.

MR. PARKER: Mr. Martin McMahon, from our Bartlesville office, will make our statement. My name is Reed Parker.

CHAIRMAN WILSON: The Procter and Gamble Manufacturing Company.

MR. BATES: Ralph Bates, the plant engineer of the Kansas City plant. And we have Ralph Peterson, a chemical engineer from our Cincinnati office.

CHAIRMAN WILSON: The Atchison, Topeka and Santa Fe Railroad Company.

MR. REEVES: J. B. Reeves. I am attorney for the railway company. There is also here Mr. C. H. Sandberg, Chief Engineer of the Eastern Lines of the railway company, and Mr. M. W. Bell, Division Engineer of the Kansas City Division of the railway company.

CHAIRMAN WILSON: The Sinclair Refining Company.

MR. FUHRI: W. K. Fuhri and Mr. W. N. Smith.

CHAIRMAN WILSON: Swift and Company.

MR. ELSON: W. B. Elson, the law department of Swift and Company in Chicago. And we also have here Mr. H. M. Wiggs, manager of our Kansas City, Kansas packing plant, and Dr. F. W. Sollc, chemical engineer from Chicago.

CHAIRMAN WILSON: Midwest Cold Storage and Ice Corporation.

MR. MOSS: W. Irving Moss, Jr., and John Murphy, attorney.

CHAIRMAN WILSON: Buick, Oldsmobile and Pontiac Assembly Plant.

MR. MURPHY: John Murphy for General Motors Corporation.

CHAIRMAN WILSON: Corn Products Refining Company.

MR. MOBERLY: Mr. H. B. Franey, Plant Manager, is present and I am here with him, John R. Moberly, attorney for the company.

MR. SAMSON: What is the name of the attorney?

MR. MOBERLY: Moberly, John R.

CHAIRMAN WILSON: Metallurgical, Incorporated. No appearance for that concern.

American Wiper and Waste Mills. No appearance.

Kansas City Power and Light Company. No appearance.

American Asphalt Roofing Company.

MR. HUMBLE: A. M. Eberle, General Superintendent; Mr. J. R. Humble, Plant Engineer.

CHAIRMAN WILSON: American Creosoting Company. No appearance.

Black, Sivalls and Bryson, Incorporated. No appearance.

City of North Kansas City, Missouri. No appearance.

Chevrolet Assembly Plant.

MR. MURPHY: John Murphy for Chevrolet and Fisher Body both.

CHAIRMAN WILSON: Ford Motor Assembly Plant. No appearance.

Fisher Body Division, Kansas City Plant.

MR. MURPHY: I just made the announcement.

CHAIRMAN WILSON: The appearance has already been noted.

Koppers Company. No appearance.

The Schenley Distillers, Incorporated.

MR. HEIDLER: W. E. Heidler, engineer.

CHAIRMAN WILSON: Sheffield Steel Division. No appearance.

Union Wire Rope Corporation. No appearance.

The Vendo Company. No appearance.

Westinghouse Electric Corporation. No appearance.

Bendix Aviation Corporation. No appearance.

Prier Brass Manufac ng Company.

MR. HODES: Henry J. Hodes, President.

CHAIRMAN WILSON: The Ruberoid Company.

MR. HUMBLE: The American Asphalt Company is a division of The Ruberoid Company; the same representation for both.

MR. SAMSON: And what is that?

MR. HUMBLE: The American Asphalt--

MR. SAMSON: I mean who is the representative?

MR. HUMBLE: Sir?

MR. SAMSON: The representative.

MR. HUMBLE: A. M. Eberle, General Superintendent, and J. R. Humble, Plant Engineer.

MR. SHARP: Mr. Chairman, my name is Sharp. We are also the consulting engineers for the City of North Kansas City. I wonder if that could be entered in the record that we are representing them?

CHAIRMAN WILSON: You wish to enter an appearance for North Kansas City, then.

MR. SHARP: Yes, sir.

CHAIRMAN WILSON: That will be noted.

MR. SHARP: Thank you, sir.

CHAIRMAN WILSON: That concludes the list of parties designated in the notice as being responsible for pollution. At this time are there any other persons or corporations who wish to appear as parties and have an opportunity to be heard? If so, they may present their names at this time and the Board will consider their request to be heard.

I hear none. I might say in that connection that at some previous hearings requests have been made by different organizations and groups for the opportunity to present general statements on the subject of water pollution, and while we appreciate such interest we do not--it is not proper to take time at this official hearing for the presentation of such statements. Although this is an administrative hearing and we want to give everyone concerned an opportunity to be heard, we have to limit the testimony on account of the limitations of time, we have to limit the evidence and the statements at the hearing either to parties who have been designated as responsible or to those who make application and are approved by the Board for the purpose of making presentations.

Now, do I hear any other requests at this time for permission to appear and submit statements or testimony?

MR. MC KEE: I am Ralph K. McKee, President and General Manager of Bio-Laboratories. I wish to appear in behalf of Missouri Valley Serum Company.

CHAIRMAN WILSON: Will the Secretary note that request for an appearance? Are you going to want to present some evidence or a statement in the course of the hearing?

MR. MC KEE: Yes, sir, statements.

CHAIRMAN WILSON: We will rule on that. The Board will take that request under advisement the next time we have a recess and you will be notified by the Secretary. Get in touch with Mr. Robert Ayers, Secretary, as to the decision of the Board.

Now, you had better see the Secretary. All parties who wish to make appearances that are not designated in the notice should see the Secretary during the next recess and give him information as to the nature of the statement you wish to present and how it bears on the subject matter of the hearing so the Board will have that for consideration.

Are there any others who wish to---

MR. KENNEDY: Mr. Chairman, may I clarify that just a bit? J. L. Kennedy with Missouri Valley Serum Company.

The Missouri Valley Serum Company, as such, is strictly a distributor, not a producer. Mr. McKee, President and General Manager of Bio-Laboratories, as the tenant is the owner of that property the same as I am. His company handled the production of various items that will be the basis of this statement, production of various biological products. Missouri Valley Serum Company as such is strictly a wholesale distributor. It produces nothing in the way of merchandise.

CHAIRMAN WILSON: I don't think there would be any question about that being in order when the time comes. I will make an announcement a little later about the order of testimony.

Now, are there any others desiring to speak?

I see a hand raised in the back of the room. Is that from a party desiring to enter an appearance?

MR. BATES: Yes, sir. The Chamber of Commerce of Kansas City, Kansas, has worked very closely with the city and with the industry in that area on this problem and would like to have the opportunity to make a statement during the hearing.

CHAIRMAN WILSON: That request will be noted.

Now, Mr. Secretary, you have a notation of all these requests, have you?

SECRETARY AYERS: Yes, sir.

CHAIRMAN WILSON: We will pass on them at the next opportunity and make an announcement immediately thereafter.

I would like to say in regard to all the parties officially designated as responsible parties, as well as others who may later be admitted, that in order to save time if there are any of you having common interests it would be desirable if you would confer with each other during recess and arrange to present your evidence or your statements through a common spokesman. We don't want to limit the right of any interested party to submit evidence and make statements in his or its behalf, but because of the time that is likely to be taken here and the desirability of getting the evidence in in an orderly manner and concluding the proceedings without wasting time, we would like to have people having common interests work together if they can do so.

As to the general nature of this hearing, I think everyone understands that this is not a court proceeding. It is an administrative hearing under the Federal Water Pollution Act and regulations, first for the purpose of enabling this Board to make findings of fact and recommendations to the Secretary of Health, Education and Welfare for dealing with the pollution of the interstate waters of the Kansas and Missouri Rivers at this locality, and, second, for the purpose of laying a foundation for further legal proceedings in case such proceedings should be in order. At an administrative hearing of this kind we try to be as liberal as possible and not be too strict about following the rules of court procedure, but at the same time we are required by the regulations to base our findings on relevant and material evidence.

In that connection the Board has adopted a motion, in accordance with the regulations, that all offers of evidence and motions shall be ruled upon in the first instance by the Chairman, subject to the right of any interested party to appeal the Chairman's decision to the Board or subject to the right of any member of the Board to request such an appeal to the Board; and it is the policy in general, in order to save time and in order to avoid the possibility of excluding something that might bear on the subject matter, to be quite liberal in the admission of evidence. I should like to call this especially to the attention of counsel in order to avoid protracted arguments on the admissibility of evidence. We do not rule on evidence with the strictness that a court does before a jury, because it is important in the trial of a court case of that kind to have such determination made at the time the evidence is introduced. But generally speaking, if evidence is offered which is relevant and material and appears to bear on the subject matter under consideration, and there is some argument about its foundation or other qualifications for admission, it will be the policy of the Chairman and the Board to admit that evidence subject to the objection, and then after the conclusion of the evidence, when the Board retires into execution session to make its findings and recommendations, the Board will sift all the evidence, determine at that time what is relevant and material, and discard any evidence which in the opinion of the Board is not relevant or material to the issues.

Further in regard to the conduct of the hearing, I call attention to these "No Smoking" signs that have been posted on the wall. That is because of the rule of the federal court against smoking in this room. Otherwise we don't attempt to stick to the strict rules of decorum that obtain in court trials. As you have already observed, the taking of photographs, if done without disturbing the proceedings, will be permitted. And if it gets warm, anyone will be privileged to take off their coats or even their neckties, if they wish.

I see some people standing in the rear of the room. You may come up and occupy the empty chairs here in front of the bar if there aren't any chairs back of the bar, if you wish.

The order of the taking of evidence and the presentation of arguments will be, first, the presentation of evidence by representatives of the Surgeon General. There are no other federal agencies appearing here.

Next will be the presentation of evidence by state agencies.

Third, by parties charged with responsibility for pollution. And unless they get together and agree otherwise, we will take them in the order of the list which I read as stated in the notice.

And then will follow the taking of evidence by any of those other parties who have requested permission to be admitted as parties and to be heard.

And then finally there will be oral arguments taken generally. First the government will have an opportunity to sum up its case, then the other parties will be taken in order, and finally the government will have an opportunity for rebuttal.

Before we proceed with the opening statements of counsel and the taking of testimony, I will inquire whether any of the parties have any motions or statements to make concerning their appearances at this time? If so, we will entertain such motions or statements.

MR. KOENIGSDORF: Mr. Chairman, this is a preliminary matter and although I am not interested in the aesthetics or desirability or non-desirability of the pollution abatement at this time, in order to protect my client, the City of Kansas City, I would like to make formal objection to the jurisdiction of this Board.

As I am sure you realize, in the Act itself it provides that this hearing may go forward to a court and be the only record that the court receives. It would be within the jurisdiction of the court in the next instance to determine whether additional evidence may be introduced or additional action taken by the parties. At this time I would like to read.

The City of Kansas City, Missouri, objects to the jurisdiction of this Commission to hear any evidence and take any action affecting the City of Kansas City, Missouri, and moves to dismiss this proceeding as to the City of Kansas City, Missouri, for the reason that Public Law 660 of the 84th Congress of the United States, also identified as 33 USCA 466, on which this proceeding is purported to be based, is absolutely void and of no effect for the following reasons:

1. Said law violates the Tenth Amendment to the Constitution of the United States expressly providing that the powers not delegated to the United States by this Constitution nor prohibited by it to the states are reserved to the states respectively or to the people.

The navigable waters within and bordering the States of Missouri and Kansas, respectively, are under the ownership and control of said respective states and the United States has no jurisdiction or right of control over said waters except to the extent authorized by the third paragraph of Article VIII of the Constitution of the United States in the regulation of interstate commerce.

2. Said law is in violation of the Act of the Congress of the United States approved March 6, 1820, entitled "An act to authorize the people of the Missouri territory to form a constitution and state government and for the admission of such state into the union on an equal footing with the original states and to prohibit slavery in certain territories", being 3 Statutes at Large 345.

3. Said Act is in violation of the Fifth Amendment to the Constitution of the United States in that it authorized the taking of the property of the city and its citizens without due process of law and without just compensation.

4. Said Act is invalid in that it does not afford due process of law, in violation of the said Fifth Amendment to the Constitution of the United States, in that it affords no right of appeal and attempts to make the ex parte fiat of this Commission evidence in another criminal proceeding.

5. Said Act is invalid because it is in conflict with Section 1 of Article I of the Constitution of the United States in that it fixes no standards of purity for water of navigable rivers and it attempts to delegate to this Commission the legislative authority to fix such standards.

6. Said Act is invalid because it is in violation of Section 1 of Article III of the Constitution of the United States vesting all judicial power in one supreme court and in such other inferior courts as Congress may ordain and establish, in that by the terms of this Act the Secretary of Health and Welfare is authorized to be both prosecutor and to select the members of this Commission to rule upon the complaint which he makes as prosecutor.

7. Said law violates the Sixth Amendment to the Constitution of the United States for the reason that this proceeding is part of a criminal prosecution and said law affords this defendant no trial by an impartial jury by the state and district wherein the crime purports to have been committed.

I should like to make one further objection and that is that within the Act itself, in 33 USCA 466g(b), the law provides that when state action has been taken to abate pollution of interstate waters such action shall not be displaced by federal enforcement action. The State of Missouri has already proceeded with an action on pollution abatement, as Mr. Johnson might well know, a distinguished member of the Commission here, and I think also that others of the federal government know that the state has taken action and that the law and the intent of Congress were that where the states are taking some action the federal government should certainly not intercede.

Thank you.

CHAIRMAN WILSON: Do you have any further statement or argument in support of your objection and motion?

MR. KOENIGSDORF: In view of the nature of the Board, I don't believe it would serve any purpose to go into a lengthy discussion of the cases involved. I can prepare a brief if the government desires, but I am not prepared at this time to submit a brief. I could make argument, but I don't believe it would serve any purpose. Our points have been made.

CHAIRMAN WILSON: Has the government anything to say on the motion?

MR. STEIN. Well, we would recommend that the motion--move that the motion be denied. I don't think the Board would want us to go into discussion of the points involved except for the last point, of course. These points have been raised in many cases and have been the subject of much litigation. I might indicate for the record that we would, of course, disagree with the applicability of any of these points here.

I would point out that the function of this Board, according to the law, is whether on the basis of evidence presented at such hearing the Board shall make findings whether pollution referred to in Subsection (a) of Section 8 of the Federal Water Pollution Control Act is occurring. I don't believe it is within the province or jurisdiction of the Board to want to consider questions at this time. I think we are all bound by the statutory limitations of the appointment of the Board and designation by the Secretary of Health, Education and Welfare.

CHAIRMAN WILSON: The motion will be denied and the objections will be overruled.

Are there any other parties who desire to make motions or other statements relating to the jurisdiction of the Board at this time?

If not, we will then proceed with the opening statements of counsel and the taking of evidence. But in that connection I wish to announce that in order to get ahead with this hearing as rapidly as possible the Board has decided that subject to possible contingencies from time to time we will remain in session from 9 a.m. until noon and from 1:30 p.m. until 5 o'clock in the afternoon. All counsel and parties should take notice of that intention. If any occasion should arise for changing those hours during the course of the hearing, why, we will consider the situation at that time.

Now, might I ask counsel for the government or for any other parties whether any arrangements have been made for a view of the territory by the Board?

MR. STEIN. Arrangements have been made for a view of the territory and that is scheduled for tomorrow morning, if that is agreeable with the Board.

CHAIRMAN WILSON: What time would that take?

MR. STEIN. 9 o'clock in the morning. I would like to call on our technical advisor, Mr. Hopkins, to speak as to the time.

Mr. Hopkins.

MR. HOPKINS: The arrangements have been made for a boat from the Corps of Engineers to be at the dock at the foot of Main tomorrow morning at 9 o'clock. The boat will have a seating capacity of not less than ten people. It is my estimate that at least two and a half hours will be required for the boat trip.

CHAIRMAN WILSON: You say you have a boat with a seating capacity of ten, is that right?

MR. HOPKINS: Yes, sir.

CHAIRMAN WILSON: So that there would only be room for a few besides the members of the Board?

MR. HOPKINS: Yes, sir.

CHAIRMAN WILSON: I am assuming that anyone else who wishes to do so may provide their own boat or other means of transportation and go along on that expedition?

MR. HOPKINS: Yes, sir, that would be quite all right.

CHAIRMAN WILSON: So that if any of the parties or members of the press desire to make arrangements to go along, they may do so, but there will not be room for them to ride on the boat which you have provided for the Board?

MR. HOPKINS: That is right, sir.

CHAIRMAN WILSON: When we adjourn tonight, then, we will make an announcement. How long do you say you think that will take?

MR. HOPKINS: At least two and a half hours.

Mr. Chairman, in making the arrangements we visualized that the Hearing Board would want to go and that perhaps counsel for some of the cities or industries might want to go. If there is demand or need for a boat larger than ten persons, I believe we can arrange to either have a larger boat or a second boat.

CHAIRMAN WILSON: Then I suggest that the counsel for the interested parties and representatives of the press and any others who wish to go get in touch with Mr. Hopkins, the Regional Engineer, during the recess in reference to arrangements to go along on that trip, because we wish to give everyone who is interested an opportunity to do so if possible.

MR. HOPKINS: Would it be possible to have a show of hands at this time, Mr. Chairman? We should make our request to the Corps before noon if we want additional boats.

CHAIRMAN WILSON: Very well. May we have a show of hands of all those outside of the members of the Board who would like to go along on this trip?

You count them, Mr. Hopkins.

MR. HOPKINS: Thank you, sir.

CHAIRMAN WILSON: Before we proceed with the opening statements and taking of testimony, have the members of the Board any suggestions to make?

Did you have a statement to make?

MR. KOENIGSDORF. I want to inquire as to a preliminary matter, if I might, please. I note in the notice that we received that reference is made to a number of cities which are located within the boundaries of the State of Missouri, I think Lexington and some other towns down the river, and I wonder if it could be stipulated, so that I would not need to object as we go through the hearing, that any matter within the boundaries of the State of Missouri not subject to action or consideration by this Board would not be considered as affecting Kansas City, Missouri, in this hearing, so that I need not object regularly as we go along as to the inadmissibility of the evidence as far as Kansas City is concerned.

CHAIRMAN WILSON. Does the government have anything to say on that?

MR. STEIN. We do not think that that needs to be stipulated, but we would have no objection to the objection of Mr. Koenigsdorf being noted wherever that should come up.

CHAIRMAN WILSON: It may be understood that that objection and proposed stipulation will be noted and any testimony to which it may apply will be taken subject thereto.

MR. KOENIGSDORF. Thank you, sir.

CHAIRMAN WILSON. How do counsel wish to make their statements? You can either all make your opening statements at this time or let the government make its statement and counsel for other parties may then make their statements before the government's evidence begins or they may reserve their statements until the beginning of their own testimony. How do you wish to do that?

MR. KOENIGSDORF: Kansas City, Missouri, would like to reserve the statement until the conclusion of the government's testimony.

MR. BRENNEISEN: Kansas City, Kansas--

CHAIRMAN WILSON: Well, the other parties may do as you like about that after the government gets through.

Mr. Stein, are you going to make the opening statement for the government?

MR. STEIN: Yes, sir.

CHAIRMAN WILSON. You may proceed.

MR. STEIN: Thank you.

This proceeding is held under Section 8 of the Federal Water Pollution Control Act, which provides, among other things, that pollution of interstate waters which is caused by discharges directly thereto or tributaries thereof are subject to abatement.

Very briefly, the steps in the abatement procedure are the calling of a conference by the Surgeon General of the Public Health Service, a public hearing such as this, and, if necessary, court action.

As indicated in the notice of this hearing, the Surgeon General has called such a conference. The conference was held in Kansas City, Missouri, on December 3, 1957. At the conclusion of the conference the conferees representing the States of Kansas and Missouri and the Public Health Service unanimously agreed that pollution of interstate waters subject to abatement under the Federal Water Pollution Control Act was occurring and this pollution was caused by discharges from municipal and industrial sources within the Kansas Cities Metropolitan Area.

The conferees also established a time schedule for remedial action, which actually was proposed by the Mayor of Kansas City, Missouri, and agreed to by him.

Subsequent to the conference summaries of the conference were prepared and distributed to the conferees as required by law. At the same time the Surgeon General recommended in writing to the official state water pollution control agencies of Kansas and Missouri that they take appropriate steps under their state laws and programs to meet the time schedule for remedial action unanimously agreed on by the conferees.

The evidence in this hearing and the presentation by the government will give due recognition to the progress made by Kansas City, Kansas, and the Fairfax Drainage District in giving assurances that these jurisdictions will meet a schedule established by their state water pollution control agency. The evidence, however, will show that wastes from the Kansas City, Missouri, area continue unabated.

The statute requires that reasonable progress be made to secure abatement of the pollution. I think the evidence will show that in Kansas City, Missouri, no progress has been made to cause abatement of the pollution. Under the law, if action reasonably calculated to secure abatement of the pollution is not taken subsequent to a conference, the Secretary of Health, Education and Welfare is required to call a public hearing. This is a mandatory duty placed on the Secretary by law and he has called this public hearing in accordance with the provisions of federal law.

All steps required by law have been taken prior to the calling of the hearing by the Secretary of Health, Education and Welfare. I think the record will show that all the steps have been taken and, in addition, innumerable conferences and efforts to adjudicate this with the city officials have been made by state and federal officials.

Under the law, pollution of interstate waters which endangers the health or welfare of persons in the state other than that in which the pollution originates is subject to abatement. Interstate waters are defined by the Federal Act as all rivers, lakes and other waters that flow across or form a part of the boundaries between two or more states. The evidence will show that the Missouri River and the Turkey Creek Sewer meet this definition of interstate waters.

The evidence will also show that discharges of wastes in the vast Kansas City Metropolitan Area, encompassing the States of Missouri and Kansas, which are often complex and commingle, clearly endangers health or welfare of persons in states other than that in which the discharge originates.

I might say that in dealing with the Kansas City Metropolitan Area we are dealing with a very, very complex situation. I think the evidence will show that we have attempted to define with particularity every source of pollution. I would hope that we would in the presentation of the evidence, for the purpose of saving time, be permitted to classify these and handle several of them at one time. However, records will be made available to opposing counsel and the Board showing each and every source of pollution.

I think the evidence will show that the Missouri River as it flows past Kansas City is a regulated stream. Because of the building of structures, such as Gavins Point Dam above Sioux City, there is just a limited amount of water available for dilution flowing past Kansas City. This amount will continue in the foreseeable future and not be available to augmentation.

I think the evidence will show that the major contributors to the pollution are the parties named in this notice. The evidence also will show that wastes causing such pollution from this area are municipal and industrial wastes generally amenable to known methods of treatment.

Our purpose here is to present evidence which will depict the hard physical facts of pollution. I don't think in dealing with physical conditions that there has to be any dispute as to the physical facts as we find them. What the evidence will show, we believe, is that the combined untreated municipal and industrial wastes of a population equivalent of more than one and a half million persons are being discharged into the Turkey Creek Sewer, the Kansas River and the Missouri River.

The evidence will also show that nine municipalities take Missouri River water below this area and I think the way we will show the effects of this will be the observations of the people using the river, water plant operators, power plant operators, commercial and recreational users of the river, who will give their experiences with the conditions of the river as they found them, what they have seen, smelled and felt.

In addition to that we will present analyses of chemists, biologists, bacteriologists and engineers who have applied all the known standard methods of water quality analysis to the river.

Generally speaking, we will show bacterial contamination by an indicator organism known as a coliform organism. The evidence will show that these coliform organisms indicate twenty to thirty times the desirable level of sewage contamination at the water plant at Lexington, Missouri. Another indicator will be streptococci bacteria.

Sometimes when we hear these reports of these chemists and biologists they are apt to sound kind of antiseptic, because they are dealing with nice facts and figures processed in a scrupulously clean laboratory. But I think the evidence will show that these clean antiseptic facts and charts brought here are actually a description of the bathroom, toilet, household and garage wastes of a big metropolitan area being flushed untreated into a river.

In addition the evidence will show that organic materials creating taste and odor problems in water supplies below the Kansas City area are being discharged from this area.

I think the evidence will show that the water plants below here are taking extraordinary measures to treat their water supply. The evidence will show, for example, that the Boonville water plant is using about one hundred pounds of chlorine per million gallons of water, whereas the average in other plants in other parts of the country may be twenty-five to forty pounds of chlorine. The evidence will show that this chlorine usage has crept up markedly year by year and I think the evidence will show that the Missouri River requires as much chlorine put into their water to make that into drinking water as you will find in any part of the country, and I don't think this is something that we as citizens have to be very proud of.

The evidence will show that disease-bearing organisms and toxic materials are present in the river. These present a hazard to persons coming into contact with river water, people who just go down to the river boating, fishing, swimming, water skiing, and so forth.

I think that will conclude our statement, except I would again like to try to indicate the function of the government representatives here. As we understand it, the Board is a fact-finding Board. We have been instructed to assist the Board and the representatives of the other parties in expediting the moving of the hearing, presenting the facts in as rapid and in as concise a manner as possible. We are not here in the role of prosecutors attempting to prove a case. All we want to do is assist the Board and the representatives of the other parties in making as complete and as rapid a factual presentation to the Board as possible.

Thank you.

CHAIRMAN WILSON: Are there counsel for any other parties who would like to make opening statements before the government proceeds with its evidence?

If not, you may proceed with your evidence, Mr. Stein.

MR. STEIN: Mr. Hopkins, Mr. Glen J. Hopkins.

SECRETARY AYERS: Do you want to swear any of your other witnesses at this time?

MR. STEIN: Swear them one at a time.

CHAIRMAN WILSON: Just a moment, Mr. Stein, before you proceed to examine this witness. We are somewhat limited here for table space for counsel. Now, I note that there are two or three or four vacant chairs here at the present counsel tables and if there are counsel for any other parties except the City of Kansas City who would like to be up in front here in a better position to cross-examine the witnesses in case they do so, I suggest that they come forward and occupy these chairs that are still vacant.

If there are still other counsel who would like to have room up in front, we might ask the Secretary to see what he can do about having another table brought in. At any rate, the counsel who want to hear what this witness says or what all the witnesses say, and to be in a position to cross-examine, should come forward as far as the facilities permit.

SECRETARY AYERS: Mr. Chairman, just a second.

(Off the record)

CHAIRMAN WILSON: The Secretary has suggested that perhaps among those who are sitting in the chairs in front of the bar there may be witnesses or others who are not counsel for interested parties and who don't have to sit that far forward and who might be willing to give up their places to attorneys who are still in the rear of the courtroom. Are there any such? Are there any attorneys still in the rear of the courtroom who would like to come forward and be in a better position to cross-examine the witnesses? And, if so, I will ask any persons who may be sitting in these front chairs to yield their places to such attorneys if they can.

We now have several vacant chairs in front of the bar, so there is plenty of room for all attorneys for parties who wish to come forward to take those chairs and be in a position to cross-examine the witnesses.

All seem to be satisfactorily seated now, so you may proceed, Mr. Stein.

MR. STEIN: Thank you.

GLEN J. HOPKINS,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. STEIN:

Q. May we have your name and address?

A. Glen J. Hopkins, 2200 Federal Office Building, 911 Walnut, Kansas City, Missouri.

Q. By whom are you employed?

A. The United States Public Health Service.

Q. What position do you hold?

A. I am Regional Engineer.

Q. How long have you been employed by the Public Health Service?

A. Sixteen years and eleven months.

Q. By whom were you previously employed?

A. The Division of Health of Missouri.

Q. In what capacities?

A. As District and Assistant Chief Enginner for the Missouri Division of Health.

Q. How long was that?

A. Seven and a half years.

Q. Were your duties in these jobs related to water pollution control?

A. Yes.

Q. Would you generally describe your duties related to water pollution control in your present job, very briefly?

A. The Public Health Service region covers the seven states along the Missouri River. I am the field representative of the Surgeon General on environmental health programs in general and in water supply and water pollution control activities specifically.

Q. Do your duties relate to carrying out the provisions of the Federal Water Pollution Control Act and the Public Health Service Act as they relate to water pollution control?

A. Yes, particularly field activities.

Q. In the state would you briefly indicate what your duties were as they related to water pollution control?

A. Review of plans and specifications for sewage treatment works, consultation with municipalities on sewage treatment needs.

Q. Have you ever had any special education or training in the field of water pollution control or sanitary engineering?

A. Yes.

Q. Would you describe that?

A. I have a Bachelor's Degree in Civil Engineering from the University of Missouri, I have a Master's Degree in Sanitary Engineering from the University of Michigan, a Master's Degree in Public Health Administration from the University of Michigan. I am a licensed professional engineer in the State of Missouri.

Q. As part of your official duties have you ever inspected and familiarized yourself with Turkey Creek Sewer, the Kansas River and the Missouri River in and below the Kansas Cities area?

A. Yes, I have, on numerous occasions.

Q. Are you familiar with the water uses in this area?

A. Yes.

Q. How are you familiar with that?

A. I have observed the river on numerous occasions; I am familiar with the water plants and industries that take water from the Missouri River; I have observed the river for such uses as recreation, hunting, fishing, boating, et cetera.

Q. Have you familiarized yourself during the past few years with the reports and literature related to these aspects of the river?

A. The Public Health Service, together with the State Health Departments, have conducted numerous investigations, studies, the reports of which I am quite familiar with.

Q. Are you generally familiar with the waste discharge systems used by the parties named in this notice which are located in the Kansas City area?

A. Yes, from observations, studies and review of reports.

Q. Who is the official custodian of the Department of Health, Education and Welfare records pertaining to water pollution control activities in this Kansas City area?

A. As Regional Engineer I am custodian of those records.

Q. Mr. Hopkins, I direct your attention to a map which purports to be a representation of the Missouri River basin.

MR. STEIN: I ask that this map be marked as Government Exhibit No. 1 for purposes of identification.

(Government's Exhibit No. 1 marked for identification.)

Q. (By Mr. Stein) Mr. Hopkins, does this map come from your official records?

A. Yes, it does.

Q. By whom was this map prepared?

A. The Missouri River Division, Corps of Engineers, Omaha, Nebraska.

Q. Will you describe the map in general terms?

A. The dotted or dashed heavy black lines outline the boundaries of the Missouri Drainage Basin. The Continental Divide is along the west (indicating), Canada to the north (indicating), the Mississippi Drainage Basin to the east (indicating). The map shows the location of the states (indicating), the state boundaries (indicating), the principal tributary streams (indicating), the impoundments that have been constructed on the Missouri River (indicating), and the portion of the river that has been improved for navigation through channel stabilization and controlled reservoir releases.

Q. On the basis of your knowledge and as part of your official duties, is the map an accurate representation of the Missouri River Basin area?

A. Yes, it is.

MR. STEIN: I offer this as Government Exhibit No. 1.

CHAIRMAN WILSON: Any objection?

MR. KOENIGSDORF: No.

CHAIRMAN WILSON: Received.

(Government's Exhibit No. 1 received in evidence.)

Q. (By Mr. Stein) Mr. Hopkins, I call your attention to a map in three parts purporting to be a representation of the Missouri River from above the Kansas Cities area to below its confluence with the Mississippi at St. Louis.

MR. STEIN: I ask that this map be labeled from the way the river flows, for purposes of identification, as Government Exhibit No. 2, the first part named as 2-A, the second 2-B, and the third 2-C, all to be considered as one government exhibit, Government Exhibit 2.

(Government's Exhibit No. 2, including 2-A to 2-C, inclusive, marked for identification.)

Q. (By Mr. Stein) Mr. Hopkins, is this map part of your official records?

A. Yes.

Q. By whom was this map prepared?

A. These three maps were prepared by the Geological Survey.

Q. Would you in general terms describe this map, treating it as one? Do they join together?

A. This is a series of three Geological Survey maps, all to the same scale, reflecting the Missouri River and its tributaries (indicating) from above St. Joseph down along the Kansas-Missouri line (indicating), eastwardly across the State of Missouri to the confluence with the Mississippi River (indicating), the Mississippi River forming the boundaries between the States of Missouri and Illinois. The location of each principal community is shown. Here (indicating) is Kansas City, Missouri, Kansas City, Kansas (indicating), the Kansas River (indicating) threading along to the eastward--to the westward--

CHAIRMAN WILSON: Just a minute, Mr. Hopkins. To which exhibit di you just now point?

A. 2-A, sir.

CHAIRMAN WILSON: If you will kindly indicate as you point to each exhibit, indicate the number of the exhibit to which you are pointing so that that will appear in the record.

A. Thank you.

CHAIRMAN WILSON: Remember that the reporter can't tell unless you make that statement as to which exhibit you are pointing.

A. The Kansas Cities are on Exhibit 2-A. The Missouri River runs generally eastward from Kansas City, leaving 2-A at this point (indicating) and being continued on 2-B past Lexington (indicating), Boonville (indicating), Jefferson City (indicating), extending on to 2-C eastward across the state to the St. Louis Metropolitan Area (indicating), joining the Mississippi River.

MR. STEIN: Mr. Chairman, I offer these maps as Government Exhibit No. 2.

CHAIRMAN WILSON: They are 2-A, 2-B and 2-C?

MR. STEIN: Yes.

CHAIRMAN WILSON: Proceeding in that order from west to east?

MR. STEIN: Yes, sir.

CHAIRMAN WILSON: And fitting together as a single combined map?

MR. STEIN: Yes, sir.

CHAIRMAN WILSON: Any objection?

No objection. It is received.

(Government's Exhibit No. 2, including 2-A to 2-C, inclusive, received in evidence.)

Q. (By Mr. Stein) Mr. Hopkins, I call your attention to Section 2 of the Federal Water Pollution Control Act dealing with comprehensive programs, Section 4 dealing with surveys and investigations, particularly Section 4 (b), and Secion 8, dealing with enforcement. Under the authorizations of this section and similar sections in preceding acts and in carrying out your duties have any engineering reports been provided to you covering the Kansas Cities Metropolitan Area and improvements in that area?

A. Yes, four such reports are in my possession.

MR. STEIN: Mr. Chairman, at this point I think we would like to give the other parties concerned, that is Kansas City, Kansas, for one, an opportunity to introduce these exhibits as their own reports. I think they rose in motion to that earlier.

The reason we are introducing these now is that these reports will be a basis of future government testimony. We are prepared to do this either way, either introduce them as the government's exhibits at this point or if the other parties want to introduce these as their exhibits, which I understand they have informally expressed a desire to do. We would have no objection to that if that were agreeable to the Board.

CHAIRMAN WILSON: Do counsel for Kansas City or any other party wish to avail themselves of this offer by the government?

MR. BRENNEISEN: If the Board please, we have four exhibits that we will wish to introduce and we can introduce them at this time. One is a 1953 engineering report, one is a supplement to that report dated in 1960, one is a sewer service charge report, and one is a water pollution abatement ordinance.

CHAIRMAN WILSON: Now, you are speaking in behalf of which agency?

MR. BRENNEISEN: Kansas City, Kansas.

CHAIRMAN WILSON: Kansas City, Kansas?

MR. BRENNEISEN: Yes, sir.

CHAIRMAN WILSON: Do these exhibits that you have just referred to indicate the same ones that Mr. Stein mentioned or are they different ones?

MR. STEIN: The same ones.

MR. BRENNEISEN: The same.

CHAIRMAN WILSON: Have you designated those exhibits yet or had them marked by number, Mr. Stein?

MR. STEIN: No, I have not, sir.

CHAIRMAN WILSON: Will you kindly have them marked so that the record may show just what exhibits are under consideration?

MR. STEIN: This exhibit is entitled "Revised Report Sewage Collection and Treatment Kansas City, Kansas 1960" prepared by "Truman Schlup, Consulting Engineer, Kansas City, Kansas."

MR. BRENNEISEN. That is right.

CHAIRMAN WILSON: We had better have that marked. Now, if you counsel can agree with each other as to whose exhibit it will be, it may be so marked. The Secretary will adopt a different series number for each party.

MR. BRENNEISEN: I see no reason why it couldn't be introduced as the government's exhibit. We have no objection.

MR. STEIN. That would be fine. Thank you, sir.

CHAIRMAN WILSON: It would perhaps be more convenient if these exhibits could be designated in order as the government's exhibits and then it will be understood that there is no objection by the other party interested.

So if you will have them marked, then, in the series of government's exhibits and refer to them by numbers, we will rule on their admission.

MR. STEIN: We would like to have this, for purposes of identification, marked as Government Exhibit No. 4. I will get to Government Exhibit No. 3 in a moment.

CHAIRMAN WILSON: Have you reached No. 3 yet?

MR. STEIN: I will. This is an earlier report which we have as No. 3. I read 4 into the record.

May I have the Chair's permission to strike the reference to this report and go back to an earlier exhibit, which is the preceding engineering report to this one?

CHAIRMAN WILSON: Then you had better have that exhibit marked as No. 3.

MR. STEIN: Yes.

CHAIRMAN WILSON: We haven't had any Exhibit 3 offered yet.

MR. STEIN: I offer "Engineering Report Sewer Separation and Sewage Treatment for City of Kansas City, Kansas 1953" prepared by "Truman Schlup, Consulting Engineer, Kansas City, Kansas," as Government Exhibit No. 3 for purposes of identification.

(Government's Exhibit No. 3 marked for identification.)

CHAIRMAN WILSON: Now, have you a short title that you can give to that exhibit?

MR. STEIN: Yes. The Truman Schlup 1953 report.

I think the Truman Schlup revised report, 1960, is a short title for the next one I would like to offer. The full title is "Revised Report Sewage Collection and Treatment Kansas City, Kansas 1960" prepared by "Truman Schlup, Consulting Engineer, Kansas City, Kansas." I ask that this be marked as Government Exhibit No. 4 for purposes of identification.

(Government's Exhibit No. 4 marked for identification.)

CHAIRMAN WILSON: What year relates to that report?

MR. STEIN: 1960, sir.

CHAIRMAN WILSON: 1960?

MR. STEIN: Yes, sir.

The next report I would like to offer for purposes of identification as Government Exhibit No. 5, which is "Report on Sewage Waste Study for Fairfax Drainage District", prepared by "Haskins, Riddle and Sharp, Consulting Engineers, 1009 Baltimore, Kansas City, Missouri, June 1959." Short title "Fairfax Drainage District Report." And I would like to have that marked as Government Exhibit No. 5.

(Government's Exhibit No. 5 marked for identification.)

MR. SAMSON: Mr. Stein, who were the engineers on that Fairfax report?

MR. STEIN: Haskins, Riddle and Sharp, sir.

The next report I would like to have marked as Government Exhibit No. 6 for purpose of identification entitled "Report on Sanitary Sewage Works for Kansas City, Missouri, Clay County" prepared by "Haskins, Riddle and Sharp, Kansas City, Missouri, 1958." This report can be known by the short title of "Kansas City, Missouri, North of the River."

(Government's Exhibit No. 6 marked for identification.)

MR. STEIN: I would like to have marked for purposes of identification as Government Exhibit No. 7 a report entitled "Report on Master Plan for Trunk Sewers and Sewage Treatment Facilities for Kansas City, Missouri" prepared by "Black and Veatch, Consulting Engineers, Kansas City, Missouri, 1958." Short title for this can be "Kansas City, Missouri, South of the River."

CHAIRMAN WILSON: That is Black and Veatch's report?

MR. STEIN: Veatch, V-e-a-t-c-h.

(Government's Exhibit No. 7 marked for identification.)

MR. STEIN: I think once we get these reports in we may move more expeditiously. This is a very complex situation.

MR. SAMSON: Mr. Stein, what is Exhibit No. 3?

MR. STEIN: That is Kansas City, Kansas, 1953, prepared by Truman Schlup. And Exhibit 4 is the revised one of that.

MR. SAMSON: Thank you.

MR. STEIN: I believe the names of the reports sufficiently describe them and if there is no objection I would like to offer these as government exhibits in the order named.

CHAIRMAN WILSON: Any objection?

MR. KOENIGSDORF: I don't know what some of those are, Mr. Chairman. There were some things read there that I never heard of before. I haven't had a chance to cross-examine anyone.

For the purpose of the record, I will make objection to the introduction of those generally on the basis of no chance of cross-examination.

MR. POWERS: Is there to be an opportunity for cross-examination of these engineers? Are they going to be produced?

MR. BRENNEISEN: Mr. Chairman, we will put on our engineer so they will have an opportunity to cross-examine, Kansas City, Kansas.

CHAIRMAN WILSON: Very well.

Well, Mr. Stein, I understand you are offering these reports in connection with the testimony of Mr. Hopkins?

MR. STEIN: They would only relate, I think as a basis of testimony by Mr. Hopkins. If Mr. Hopkins, or any of the other government witnesses, uses these reports as a basis for their opinionsor determinations, the government witness, of course, will be available for cross-examination. This is the only purpose for which the government introduces these exhibits.

CHAIRMAN WILSON: You are offering them all as being relevant and material to the subject matter of the hearing?

MR. STEIN: Yes, sir.

CHAIRMAN WILSON: Then they will be received subject to the general objection made by counsel and subject to the right of counsel to cross-examine or to examine and cross-examine any witnesses with reference thereto and to make more specific objections if desired later.

(Government's Exhibits Nos. 3 to 7, inclusive, received in evidence.)

Q. (By Mr. Stein) Now, under the authorizations of the Federal Water Pollution Control Act and in carrying out your duties have you been personally involved in official activities concerning abatement of pollution in the Kansas Cities area?

A. Yes, for several years.

Q. Will you, on the basis of such personal participation and your official records, outline briefly the activities of the Public Health Service in this regard?

A. The first activity of the Public Health Service concerning pollution of the Missouri River was undertaken under Public Law 845, The Federal Water Pollution Control Act of the 80th Congress. As officer in charge of the Missouri River Basin office of the Public Health Service I suggested to the five state water pollution control agencies concerned with that reach of the Missouri River between Yankton, South Dakota, and the mouth to undertake a study of the extent of pollution of the Missouri River and corrective measures that might be needed.

As a part of my official responsibilities on August 24, 1949, I requested a meeting of the chief engineers of the five state health departments, South Dakota, Nebraska, Iowa, Kansas, and Missouri, to consider a cooperative investigation of pollution of the lower Missouri River. It was on January 17, 1950, that the last signature was secured committing each of the five states to a comprehensive study of the lower Missouri River. The study was conducted during calendar year 1950 and a report of the study was issued by the Public Health Service as Water Pollution Series No. 47. It was issued under the co-authorship of the Public Health Service and the five cooperating state health departments.

A conclusion of this report was that pollution of the Missouri River was excessive and that each state agency would proceed with programs for waste treatment for Missouri River cities and industries located therein.

Q. Do you have a copy of that report?

A. Yes. It was a rather extensive report of some 175 pages, widely distributed in 1952.

Q. As far as you know, was this report distributed to the parties named in this proceeding?

A. Yes.

Q. In 1952?

A. Yes.

MR. STEIN: I ask that this report be marked for purposes of identification as Government Exhibit No. 8. It is named as "Water Pollution Series No 47", entitled "Lower Missouri River Basin Water Pollution Investigation, a Cooperative State-Federal Report on Water Pollution, October 1952," and it was issued on its face by Iowa Department of Health, Missouri Division of Health, Kansas Board of Health, Nebraska Department of Health, Minnesota Department of Health, South Dakota Department of Health, and the Federal Security Agency, Public Health Service.

(Government's Exhibit No. 8 marked for identification.)

CHAIRMAN WILSON: Any objection?

MR. ELSON: I would like to ask, you indicated that copies of the report had been distributed to the parties to this proceedings?

MR. STEIN: Yes.

MR. ELSON: When you said this proceeding, you mean the current proceeding?

MR. STEIN: Current proceeding.

MR. ELSON: What do you mean by parties to the proceeding?

MR. STEIN: Were you named in the first or second list, sir?

MR. ELSON: We are in the first list.

MR. STEIN: And you did not get a copy of this report?

MR. ELSON: I have no--

CHAIRMAN WILSON: Which agency do you represent?

MR. ELSON: Swift and Company.

A. The reports were issued following the release of the report to all of the industries listed in the tabulations, mentioned in the report.

Q. (By Mr. Stein) Is Swift listed in the tabulations?

A. Yes.

MR. ELSON: You don't have a record of which office it was sent to, do you?

A. I do not have that record at this time. I believe the state representatives can give you that information.

MR. ELSON: I am personally not in possession of a copy nor have I seen one.

CHAIRMAN WILSON: Well, do you interpose a formal objection at this time?

MR. ELSON: No objection to the report as such, only subject to being shown that we have been given a copy of it. I merely want the record to be complete.

CHAIRMAN WILSON: You as a representative of Swift and Company may have an opportunity to examine the exhibit.

MR. ELSON: And the list of transmittal of copies.

CHAIRMAN WILSON: And examine or cross-examine witnesses and make any further specific objections to it that you wish at any time.

MR. ELSON: No objection to the introduction.

MR. POWERS: I would like to inquire, Mr. Chairman--

CHAIRMAN WILSON: Just a minute.

For whom are you speaking?

MR. MURPHY: Just for the record, on behalf of General Motors Corporation, we have no current record of having received a copy of this Exhibit 8.

CHAIRMAN WILSON: Are there any other objections or statements in respect to this report?

MR. FUHRI: Fuhri on behalf of Sinclair Refining Company. We have no record of having received this exhibit.

MR. ROPER: L. J. Roper, National Cylinder Gas. I have no record of receiving such a report.

MR. MURPHY: My name is John Murphy, but I think the reporter knows that.

CHAIRMAN WILSON: But remember that when people rise and speak from different parts of the hall it may be difficult for the reporter to identify them by voice. So if anyone except the counsel who are at the immediate front table will please be careful to state their names and whom they represent each time they rise to speak, it will facilitate the clarity of the record.

MR. REEVES: Mr. Chairman, please, J. B. Reeves on behalf of the Atchison, Topeka and Santa Fe Railway Company. We have no record of what has been marked for purposes of identification as Exhibit No. 8.

MR. STEIN: Mr. Chairman, I would like to say for purposes of the record that in the interest of saving time many of these exhibits are placed in the record subject to connection later. I think Mr. Jack Smith of Missouri, in charge of distributing these reports to many of the industries in Missouri and the representative of Kansas, will be here and will be given an opportunity to speak for purposes of this report.

I would also like to say that reports of this type are just to be used in connection and as a basis for government testimony at this hearing either by reference or statement, and any statement that these folks might make, these witnesses might make, will be subject to cross-examination. We do not intend for this report and the 1953 report, except where it is specifically referred to, to necessarily relate the conditions today.

CHAIRMAN WILSON. Are there any other objections or statements concerning the offer of this Exhibit 8?

MR. POWERS: Mr. Chairman, Powers, Kansas City.

I would like to have it made clear the date as of which this report was made. Do I understand it is before 1952? It was issued October 1952.

MR. STEIN: Yes.

MR. POWERS: And it depicts conditions a year or two before that?

Q. (By Mr. Stein) Mr. Hopkins?

A. Conditions during calendar year 1950, I believe, Mr. Powers.

MR. POWERS: Thank you.

MR. STEIN: I offer this as Government Exhibit No. 8.

CHAIRMAN WILSON: The report will be received subject to the objections and statements that have been made and under the conditions that I previously stated, subject to the right of any party to examine or cross-examine witnesses with reference thereto and to make further specific objections if desired.

(Government's Exhibit No. 8 received in evidence.)

Q. (By Mr. Stein) Will you proceed with your description of public health activities, Mr. Hopkins?

A. Yes. The Federal Water Pollution Control Act of the 80th Congress, Public Law 845, provided that the Surgeon General of the Public Health Service shall prepare or adopt comprehensive programs for control of water pollution in the major river basins throughout the country. Pursuant to this responsibility, the Surgeon General adopted as his comprehensive program for the Missouri Basin a report identified as Water Pollution Series No. 56 as developed by the state water pollution control agencies of the ten Missouri Basin states. This report was released and widely distributed in July of 1953. It listed specifically the waste treatment needs for Missouri River cities and industries, including Kansas City, Missouri, and Kansas City, Kansas. It also contained objectives of water quality agreed upon by the ten state water pollution control agencies of the Missouri Basin to guide the state water pollution programs. It is a sizable report, some 125 pages.

MR. STEIN: I ask that this report be marked as Government Exhibit 9 for purposes of identification. The report is entitled "A Comprehensive Program for Control of Water Pollution, Missouri Drainage Basin, a Cooperative State-Federal Report on Water Pollution", dated "July 1953." The names appearing on it are the Colorado Department of Public Health, Iowa Department of Health, Kansas Board of Health, Minnesota Department of Health, Missouri Division of Health, Montana Board of Health, Nebraska Department of Health, North Dakota Department of Health, South Dakota Department of Health, Wyoming Department of Public Health, U. S. Department of Health, Education and Welfare, Public Health Service.

A report of this type is required to be developed by the Surgeon General under Section 2 of the Federal Water Pollution Control Act as depicting a comprehensive program. This report has been prepared in discharge of that statutory responsibility, has been referred to on numerous occasions in the Federal Register.

I offer this report as Government Exhibit No. 9.

(Government's Exhibit No. 9 marked for identification.)

CHAIRMAN WILSON: Any objections?

It will be received under the same conditions as stated with reference to the preceding report.

(Government's Exhibit No. 9 received in evidence.)

Q. (By Mr. Stein) Will you continue, Mr. Hopkins?

A. Yes. To implement carrying out the comprehensive program as adopted by the Surgeon General, as a part of my official duties I called a meeting of the state sanitary engineers of South Dakota, Iowa, Nebraska, Kansas and Missouri to consider a uniform program to apply to the interstate portion of the Missouri River. This meeting was held in Omaha, Nebraska, on September 15, 1953, and resulted in agreement by the five state sanitary engineers that a uniform program should proceed throughout the lower Missouri River. The five state health departments agreed that the principal objective of the pollution abatement program would be the improvement of raw water quality for domestic use. Removal of settleable and floating solids would be considered the minimum accepted treatment.

In addition, in the review of plans and specifications, each state would give consideration to programs of waste salvage, improved housekeeping, fine screening, pretreatment, or other control of industrial wastes, such as plating or packing house wastes, to insure reasonable reduction of oils, bloods, paunch manure, toxic materials, and other objectional matter. Each state agreed to contact its municipalities, outline the program to them and secure their cooperation if at all possible.

The states further agreed at this meeting that at such time as joint state-federal progress reviews indicate the enforcement program of any one state to be unsuccessful, the five states would collectively request the Public Health Service to initiate enforcement proceedings as provided for by the Federal Water Pollution Control Act.

CHAIRMAN WILSON: We will take a ten-minute recess.

(RECESS)

CHAIRMAN WILSON: The hearing will be in order.

You may proceed, Mr. Stein.

Q. (By Mr. Stein) Mr. Hopkins, as official custodian of the records of the Department of Health, Education and Welfare concerning water pollution in the Kansas City area, do you have copies of the letters calling a conference referred to in the notice of the hearing?

A. Yes, I do.

Q. May I have those letters?

MR. STEIN: I ask that these letters be marked as Government Exhibit No. 10, one to Missouri addressed to Dr. Hardwicke and dated October 4, 1957, signed by L. E. Burney, Surgeon General, and the other to Kansas addressed to Dr. Hood, dated October 4, 1957, signed by L. E. Burney, Surgeon General, the one to Missouri to be labeled 10-A, the one to Kansas 10-B, both to be considered as one exhibit, as Government Exhibit No. 10.

(Government's Exhibit No. 10, including 10-A and 10-B, marked for identification.)

CHAIRMAN WILSON: Any objections?

MR. KOENIGSDORF: May we see them?

CHAIRMAN WILSON: I hear no objections. They will be received.

MR. STEIN: It will be noted that return receipts have been affixed to these letters.

CHAIRMAN WILSON: You indicate by that that the originals were sent by registered mail?

MR. STEIN: Originals were sent by registered mail, return receipts were requested and return receipts are affixed to the letters in accordance with standard government procedure.

CHAIRMAN WILSON: You are offering those receipts as part of the exhibits to which they are attached?

MR. STEIN: Yes, sir.

CHAIRMAN WILSON: They will be received.

MR. STEIN: They have been offered in evidence and been accepted, haven't they, sir?

CHAIRMAN WILSON: That is right.

(Government's Exhibit No. 10, including 10-A and 10-B, received in evidence.)

Q. (By Mr. Stein) Prior to the calling of this conference were there other preliminary steps?

A. Are you in reference to the actions of the Public Health Service?

Q. Actions of the Public Health Service.

A. Yes, there were several more of those.

Q. Would you let me have those now, please?

A. The agreement among the five states that I mentioned in my closing statement are the States of South Dakota, Nebraska, Iowa, Kansas, and

Missouri, each state represented by the chief sanitary engineer of its health department.

On February 26, 1954, the Chief Division of Water Pollution Control, Public Health Service, Washington, transmitted to the Division of Health of Missouri and to the Kansas State Board of Health a letter and report entitled "Interstate Pollution in the Missouri River Below Kansas City" and suggested that the states take action to abate this pollution.

In a letter dated March 31, 1954, addressed to the Chief of the Division of Water Pollution Control, the Director of the Bureau of Public Health Engineering of the Division of Health of Missouri acknowledged the Public Health Service report of interstate pollution resulting from wastes discharged by Kansas City, Missouri, and advised the Division of Health had held conferences with the officials of Kansas City on January 18, 1955, and had submitted to the city council of Kansas City a report recommending abatement of pollution. The January 18th letter advised that Kansas City, Missouri, would be expected to arrange financing by January 1957 and to award construction contracts for pollution abatement works by January of 1959.

MR. POOLE: Question. What was the date of that letter, sir?

CHAIRMAN WILSON: March 31, 1954.

MR. POOLE: That is what I thought he said.

A. Yes, sir.

MR. POOLE: And I didn't understand how you could refer to a 1955 conference.

A. I think there are two letters here. The March 31, 1954, letter was in reply to the Chief of the Division of Water Pollution Control's report on interstate pollution below Kansas City. And another letter from the Division of Health advising that on January 18, 1955, it had again met with the city.

MR. POOLE: All right.

A. In a letter dated April 5, 1954, again addressed to the Chief, Division of Water Pollution Control of the Public Health Service, the Kansas State Board of Health advised that its staff had been in personal contact with officials of the Kansas communities concerned and expressed confidence that the Kansas communities would accept their responsibilities and carry out sewage treatment.

On March 3rd my office--

MR. SAMSON. What year, Mr. Hopkins?

A. March 3, 1955. My office of the Public Health Service received a copy of a letter advising that on March 1, 1955, the Kansas State Board of Health had transmitted to the City Manager of Kansas City a resolution of the Kansas State Board of Health dated February 18, 1955, requesting that the discharge of excess garbage and of refuse from the hog feeding operations to the Kansas River be stopped on or before July 1, 1955, and urging Kansas City, Missouri, to initiate plans for treating the remaining pollution discharged through the Turkey Creek Sewer.

On May 25, 1955, the Public Health Service arranged an inspection trip of the Missouri and Kansas Rivers, using the Corps of Engineers boat the Sergeant Floyd, to observe sewer outlets and waste discharges from the entire metropolitan area. Included in the party were the Mayor, the City Manager, the Director of Public Works, and the Health Officer of Kansas City, Missouri, Mayor Mitchum and Commissioner Regan of Kansas City, Kansas, and representatives of the Kansas State Board of Health and the Missouri Division of Health, also of the Public Health Service. At the time of the boat inspection, extensive sludge deposits were noted below the outfall of the Turkey Creek Sewer, large masses of sewage materials were floating on the water surface, and profuse gas bubbling from the decomposition of submerged sludge was observed. On that date the flow in the Kansas River was approximately 1,500 cubic feet per second.

MR. SAMSON: Mr. Hopkins, is that a normal flow or is that a high flow or a low flow?

A. It is probably average flow for that time of the year.

In a letter dated June 27, 1955, the City Manager of Kansas City, Missouri, advised the Kansas State Board of Health that the city would terminate the flushing of hog pen cleanings and excess garbage to the Kansas River, would terminate that before July 1, 1955. The City Manager provided my office a carbon copy of this letter and the waste discharges mentioned were terminated on or before July 1, 1955.

In the absence of any positive progress in abating pollution from sewage and industrial wastes originating in the metropolitan area, on October 4, 1957, the Surgeon General of the Public Health Service announced a formal conference on interstate pollution of the Missouri River below the Kansas City Metropolitan Area as provided for under the Federal Water Pollution Control Act, the conference to be held on December 3, 1957. The notice was mentioned by Mr. Stein as an exhibit a moment ago.

Q. (By Mr. Stein) That was Exhibit No. 10. Was this conference in fact held, Mr. Hopkins?

A. Yes, it was in fact held.

Q. Did you participate in the conference?

A. Yes, I participated as the conferee for the Public Health Service.

MR. STEIN: For purposes of the record, I think that--

Q. (By Mr. Stein) Where was the conference held in Kansas City?

A. In the City Hall, in the council chambers room in the City Hall here in Kansas City.

Q. In Kansas City, Missouri?

A. Missouri, yes.

Q. That is slightly different from the place named in the notice. Were the parties notified of this change?

A. Yes, each of the parties was notified that the Mayor had made available a room in the City Hall to hold the meeting and conferees representing the States of Kansas, Missouri and the Public Health Service were in attendance.

Q. The law provides that subsequent to such a conference the Surgeon General prepare a summary of the conference and make it available to the conferees. Was this done?

A. Yes, this was done under date of January 31, 1958.

Q. The law also provides that if the Surgeon General believes upon the conclusion of the conference that effective progress toward abatement of pollution is not being made, he shall recommend to the appropriate state water pollution agency that it take remedial action. Did the Surgeon General do this after this conference?

A. Yes; that was contained in the January 31, 1958, communication.

Q. To whom did he send these communications?

A. They were sent to Dr. Hardwicke, Director of the Division of Health of Missouri, and to Dr. Thomas Hood, Executive Secretary of the Kansas State Board of Health.

Q. Were there attached to these communications a summary, enclosed with these communications a summary of this conference?

A. Yes, sir, there was.

Q. Do you have a copy of such a summary?

A. I do.

MR. STEIN: I should like to have these marked for purposes of identification as Government Exhibit No. 11. They are in the form of letters with return receipts attached, signed return receipts, addressed to Dr. Hardwicke and Dr. Hood of Missouri and Kansas respectively, and I would like to indicate that attached to each of the letters of this exhibit was a summary of the conference, for purposes--

CHAIRMAN WILSON: If you are offering two as a combined exhibit, you had better designate one as 11-A.

MR. STEIN: Yes, sir.

CHAIRMAN WILSON: Which one will that be?

MR. STEIN: That will be the one to Missouri, and the one to Kansas 11-B, both to be considered having a summary attached, as a combined exhibit considered as Government Exhibit No. 11.

(Government's Exhibit No. 11, including 11-A to 11-C, inclusive, marked for identification.)

CHAIRMAN WILSON: Are the contents identical?

MR. STEIN: The contents of the letters are identical.

CHAIRMAN WILSON: Then 11-A is the one that went to Missouri?

MR. STEIN: Yes, sir.

CHAIRMAN WILSON: And 11-B is the one that went to Kansas?

MR. STEIN: Yes, sir. And the summary is 11-C, which was enclosed with both, a summary of the conference.

CHAIRMAN WILSON: Then 11-C was a summary that was enclosed with both 11-A and 11-B and you are offering those as sent by registered mail with receipts attached?

MR. STEIN: Yes.

CHAIRMAN WILSON: Any objection?

MR. STEIN: I should like to indicate that 11-C is a summary of the conference and this has been quoted in the notice of the hearing and already made part of this record. I merely am introducing it at this point to show that in accordance with the law the summary was sent to the conferees.

CHAIRMAN WILSON: Hearing no objection, they will be received.

MR. STEIN: These will be received in evidence, then?

CHAIRMAN WILSON: They have been received.

(Government's Exhibit No. 11, including 11-A to 11-C, inclusive, received in evidence.)

Q. (By Mr. Stein) Would you proceed, Mr. Hopkins?

A. In a communication dated January 11, 1960, and addressed to the Surgeon General of the Public Health Service, the Executive Secretary of the Kansas Stated Board of Health advised of concern about the apparent lack of progress in Kansas City, Missouri, and the failure of officials of Kansas City, Missouri, to fulfill the commitments which they made about the treatment of sewage at the conference called by the Public Health Service on December 3, 1957. In the communication the Executive Secretary of the Kansas State Board of Health requested that the federal government take further action in this interstate pollution matter.

MR. JOHNSON: What was the date of that communication?

A. January 11, 1960.

MR. JOHNSON: Thank you.

A. In a communication dated January 8, 1960, and addressed to the Surgeon General of the Public Health Service, the Executive Secretary of the Missouri Water Pollution Board advised that progress in abating pollution by Kansas City, Missouri, was at a standstill and recommended further action be taken by the federal government in the interstate pollution matter.

Q. (By Mr. Stein) Mr. Hopkins, you were present at the beginning of this hearing, were you not?

A. Yes, sir.

Q. Did you hear the notice of hearing referred to incorporated in the record?

A. Yes, sir.

Q. Do you have any indications in your record that this notice was served on the parties?

A. Yes, I do have such records.

Q. What form does that take?

A. An Affidavit of Service.

Q. Are there return receipts requested?

A. Return receipts are requested, attached to each of the mailings.

MR. STEIN: I ask that this be marked as Government Exhibit No. 12 and all these Affidavits of Service and the return receipts which were requested and received and attached thereto be considered as one exhibit, and I offer these in evidence as Government Exhibit No. 12.

(Government's Exhibit No. 12 marked for identification.)

CHAIRMAN WILSON: Mr. Stein, if that consists of a number of copies of this same Exhibit 12, with separate return receipts attached, I think it would be desirable to have each of those designated by a letter of the alphabet and state from which agency the receipt was received.

MR. STEIN: Yes.

CHAIRMAN WILSON: I understand that these are all copies of the notice of this hearing. Is that correct?

MR. STEIN: Sir, the affidavit is prepared by the person designated in our department as the person who mailed this, James R. Curtis, sworn to before Lloyd A. Tyler, Notary Public, on the 3rd day of June, 1960, where he has made an affidavit listing all the parties he served this notice on and mailed them by registered mail and has affixed the return receipts to them and has attached one copy of the notice in the back.

CHAIRMAN WILSON: Then do we understand that this exhibit, Government's Exhibit 12, consists of a copy of the notice of this hearing--

MR. STEIN: Yes, sir.

CHAIRMAN WILSON: --with an Affidavit of Service attached referring to all the parties to whom the notice was sent by registered mail, with the return receipts received from those parties?

MR. STEIN: Yes, sir.

CHAIRMAN WILSON: Very well. Are there any objections?

Hearing none, the exhibit will be received.

MR. STEIN: In evidence. Thank you, sir.

(Government's Exhibit No. 12 received in evidence.)

Q. (By Mr. Stein) Mr. Hopkins, as part of your official duties in Kansas City, since the calling of this hearing to the best of your knowledge and belief has the factual situation changed any other than described in the notice of the hearing?

A. No. The wastes are still being discharged without treatment.

MR. STEIN: Mr. Chairman, we have no further questions of Mr. Hopkins at this time. However, we should like to reserve the privilege of recalling Mr. Hopkins to the stand at the conclusion of the main portion of the government's case, presentation. Thank you.

CHAIRMAN WILSON: Any cross-examination at this time by Kansas City?

MR. KOENIGSDORF: I would like to ask of counsel, if I might, please, if you are going to-- You said all of these exhibits that were introduced were for the purpose of supporting questions that would be asked of the witness. Now, in your blanket question that the situation hasn't changed, are we to take it as true all of those various exhibits that you introduced that are hundreds of pages long--what were you asking that question for? I would just like to have a clarification on that, if I might, please.

MR. STEIN: No, I don't think you are asked to take that as true. What we wanted to do was show by Mr. Hopkins that all the procedures were complied with and procedurally what the Public Health Service has done throughout the years. Now, the recital stopped, as far as the record has gone, with the service of the notice by the Secretary's representative. All we are doing is showing that as part of our official action nothing was called to our attention for any drastic change in the recital as made by the Secretary in the notice.

MR. KOENIGSDORF: In your last question that you asked, that there has been no change, you refer to the procedural matter that has been gone through and that all those things have been done, is that right?

MR. STEIN: All these things have been done. And also that no substantial change has been called to our--to Mr. Hopkins' office's attention to cause us right at the outset to say that the notice does not represent a factual picture as we best understand it.

MR. ELSON: You are just referring to something that might have happened within the last three or four weeks?

MR. STEIN: That is right. Just to bring this right up to the minute.

CHAIRMAN WILSON: Any cross-examination of the witness at this time by any other parties?

MR. KOENIGSDORF: I have only one or two questions at this time.

CHAIRMAN WILSON: Go ahead.

CROSS-EXAMINATION

BY MR. KOENIGSDORF:

Q. Mr. Hopkins, at the conference which you referred to in December of 1957, I believe it was, at which you stated certain officials of Kansas City, Missouri, were present-- do I have the date correct?

A. December 3rd, I believe.

Q. 1957. What official action was taken by Kansas City, Missouri, at that time, to your knowledge?

A. As I recall, the Mayor, speaking on behalf of the city council, admitted that the city was discharging wastes that undoubtedly constituted pollution and he volunteered or presented a schedule which the city council would pledge to attempt to meet to abate the pollution.

Q. Do you recall, sir, if that was in the form of an ordinance or resolution or in a formal meeting of the council?

A. To the best of my knowledge, the Mayor was reporting on a meeting of the council just before the conference was held. I do not remember a formal resolution of the city council or other documentation other than the Mayor's statement, which I believe is, of course, in the transcript of the conference if there are specific questions.

Q. Do you know of your own knowledge, sir, if any action was taken at that time which would constitute an official action by Kansas City and be recorded in the minutes of the proceedings of the council?

A. I believe the transcript of the Mayor's statement that he was speaking on behalf of the city council and with their concurrence--

Q. I might interrupt you just a moment, sir. I asked if to your own knowledge and you started out that you believe. To your own knowledge was there any official entry upon the minutes of the records of Kansas City as to this particular proceeding?

A. To my own knowledge, I heard the statement that is reflected in the transcript. I do not know of any official action in the City Hall documentation.

MR. KOENIGSDORF: Thank you, sir. No further questions.

CHAIRMAN WILSON: Any other questions?

That is all, Mr. Hopkins.

MR. STEIN: May we, for clarification of the record, ask Mr. Hopkins a question on redirect, please?

CHAIRMAN WILSON: You may proceed.

REDIRECT EXAMINATION

BY MR. STEIN:

Q. Mr. Hopkins, I have handed you what purports to be a transcript of the conference, Pollution of Interstate Waters, Missouri River, Kansas City Metropolitan Area, Kansas City, Missouri, December 3, 1957, and I believe the transcript was prepared by the same reporter here today. I would like for you to look at the transcript and refresh your memory, particularly to call your attention to the paragraph on the bottom of page 8 relating to Mayor Bartle's statement at that time.

A. It is a rather lengthy statement. I will have to look through it.

Q. It is just the paragraph right at the bottom of page 8.

A. Starting "The U. S. Public Health Service"--

Q. No, "The purpose of this rather lengthy introduction".

A. "The purpose of this rather lengthy introduction is to convince the panel and to make public record of the fact that Kansas City, Missouri, fully recognizes the fact that objectionable pollution exists and that this city fully realizes that action must be taken to reduce that contamination down to an acceptable level. The city has taken certain steps to reduce the pollution"--

Q. Well, that is all.

MR. JOHNSON: Who is that a quote from?

A. Mayor Bartle.

MR. STEIN: That is a statement the Mayor made to the conference that we held on December 3, 1957.

CHAIRMAN WILSON: What was the Mayor's name at that time who made that statement?

MR. STEIN: Mayor Bartle. And my information is that he is still the Mayor.

We have no further questions.

CHAIRMAN WILSON: Any cross-examination?

That is all, Mr. Hopkins.

(Witness withdrawn)

MR. STEIN: Mr. Pafford.

ROBERT J. PAFFORD, JR.,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

CHAIRMAN WILSON: May we have this witness's full name now, please?

A. My name is Robert J. Pafford, P-a-f-f-o-r-d, Jr.

DIRECT EXAMINATION

BY MR. EDELMAN:

Q. By whom are you employed, Mr. Pafford?

A. Employed by the U. S. Army Engineers, Missouri River Division office, at Omaha, Nebraska.

Q. Will you please describe the functions of your position there?

A. I have two positions in normal assignment there. One, I am Chief of the Reservoir Control Center and as such, responsibly in charge of functional operation of the Missouri River main-stem reservoirs. I have a second formal position there, Chief of the Planning and Reports Branch of the Missouri River Division office, through which position I supervise the Corps of Engineers preauthorization project planning, hydrologic and hydraulic engineering, and economic evaluation of all Corps projects in the Missouri River Basin.

Q. In these two positions, Mr. Pafford, are you familiar with the flood control program and plan of the Corps of Engineers, with particular reference to the flow of the Missouri River at the Kansas City area?

A. Yes, sir, I am. I have worked on that for many years.

Q. Can you tell us what that program and plan is?

A. With respect to the Missouri River itself, the Flood Control Act of 1944 approved a general comprehensive plan for the Missouri River Basin which included a series of six very large multiple-purpose reservoirs on the Missouri River for the control and regulation of flow of that stream. I might mention the Army Corps of Engineers is the federal construction and operation agency for these six projects.

All six of these reservoirs are located on the Missouri River upstream from Kansas City. The system collectively controls some 57 percent of the drainage area of the Missouri Basin upstream from the gauging station at Kansas City, which is just below the mouth of the Kansas River. Four of these six projects I have referred to are now in actual operation. They are Fort Peck in Montana, Garrison in North Dakota, Fort Randall in South Dakota, and Gavins Point on the Nebraska-South Dakota boundary. Another project, Oahe, in South and North Dakota, is now in limited initial operation, and the sixth, Big Bend in South Dakota, is just coming under construction.

These projects were designed to regulate practically the entire flow of the Missouri River at Sioux City, Iowa, up north of here and will have a very substantial effect on the discharges of the Missouri River at Kansas City.

As background, I believe I should mention that these projects will be operated as a multiple-purpose coordinated system. The primary purposes for which these reservoirs were authorized and are being operated are flood control, irrigation, navigation, and hydroelectric power generation. They have been actually operated that way since they came into operation beginning in 1934 and according to the law that is the way they will be operated until such time as the law may be changed, if ever.

In planning these operations, because of so very many purposes and so very many interests involved throughout the Missouri Basin, we draw up actual operating plans a year in advance of operation. In other words, every year we draw up a plan for operations a year ahead. These plans are reviewed and approved by a special coordinating committee on Missouri River main-stem reservoir operations and then the operations are carried out in detail through day-to-day scheduling from my office.

I might mention, the coordinating committee is composed of official representatives of eight federal agencies and nine Missouri Basin states.

Q. When you speak of day-to-day scheduling from your office, do you mean that your office controls the release of water from these impoundments?

A. Orders are sent to each power plant for power to be generated and to each dam for the amount of water to be released on an hour-by-hour and day-to-day schedule. The orders are composed by my staff and signed by myself, sir.

Q. Can you tell us what the effect of this kind of regulation has been on the flows in the Missouri River in the past year or so?

A. With particular respect to the effects at Kansas City you mean?

Q. That is right.

A. I might say that they follow a broad seasonal patterning of releases. We have what is called the navigation season on the Missouri River, which normally extends from late March to late November if there is enough water, it may be shortened, and then the non-navigation winter season. During the navigation season releases are scheduled to meet certain minimum flow criteria at key points on the river. For instance, there is flow criteria at Omaha, at Nebraska City, at Kansas City, to provide sufficient water for adequate depth for navigation during the navigation season. I should mention these flow rates to show you some idea of how we do this.

During the navigation season we don't want to see the water flow less than 25,000 cubic feet per second at Omaha nor less than 35,000 cubic feet per second at Kansas City, so we adjust the flows to hit those minimums. During the winter years when tributaries below Omaha, for instance, contribute a substantial flow to the Missouri River, we regulate the flow for, let's say, 25,000 cubic feet per second at Omaha; the flow may be somewhere around 40,000 or 50,000 second feet, or slightly higher, at Kansas City during the earlier months of the year, the high water season. I would say generally from April until early July the discharges under our operating pattern at Kansas City fluctuate somewhere above 35,000 cubic feet per second.

In the latter half of the year, the dry part of the year here, in normal years the discharge target we have at Kansas City is what we operate for, that automatically gives us enough water at Omaha, and the discharges are very close to 35,000 cubic feet per second in the navigation season.

Now, the other part of the year, the non-navigation season, the system is operated with a dual objective. When I say the system I mean the reservoir system. We make sufficient releases from Gavins Point Dam, the lowermost project in the system, to help us maintain the firm power output we need in the system and to provide a minimum flow for water supply for municipalities and industry on the lower river.

We started this operation in 1954. We asked for and obtained the results of special studies by the Public Health Service and the state sanitary engineers of the lower river states as to what were the minimum flows we should gear this reservoir operation to. They gave us flows at all seasons through the year. During the navigation season the flows that were established as minimum were less than the navigation season flows, so I won't bother you with mentioning them. In the winter season at Kansas City, for instance, we were given in 1954 a minimum release that should be maintained or a minimum flow that should be maintained of 7,600 cubic feet per second in the mid winter season at Kansas City. That is how we started in 1954.

Then in 1956 we had a special recommendation from the Public Health Service, backed up by the state representatives on our coordinating committee from Missouri and Kansas, that we make a temporary increase in that winter level of 2,000 cubic feet per second; in other words, that we try to maintain a flow of 9,600 cubic feet per second instead of

7,600 at Kansas City. This increase was agreed upon by our coordinating committee and by ourselves, the Army Engineers, as an interim measure to aid in alleviating a bad odor and taste problem which had been reported on the river in Missouri below Kansas City in the winter of 1955-56.

This agreement to this temporary increase in winter discharge criteria in Kansas City was made by the coordinating committee and by ourselves with a definite understanding that the increased release would be required only for an interim period consistent with reasonable progress in pollution control at the Kansas Cities.

Q. Is this agreement still in effect, Mr. Pafford?

A. This agreement has been reviewed every year as we prepare our annual operating plans. It has been reviewed again this year. There is considerable increasing protest from representatives of the upper basin states who would like to see these reservoirs filled faster, that this has been going on for a long time running this extra water down the river, and there is increasing opposition to it, but it has been agreed to again for the next year.

Q. Do your long-range plans contemplate continuing this additional flow of 2,000 cubic feet per second indefinitely?

A. We have no agreement to continue it beyond one year ahead of the present time at the present time. Personally, I have had the feeling--we have been doing this five years now, this will be our fifth year--I have had the feeling that certainly another four or five years would be the absolute longest this could be continued. There is too much opposition from other parts of the basin.

MR. SAMSON: May I interpose right here at this point? Where did your objections come from on odor and taste below Kansas City?

A. They were reported by numerous water works at cities down the river: Jefferson City, Glasgow, Lexington, St. Louis County, St. Louis City.

MR. SAMSON: And that was back in about 1956, did you say?

A. The problem first came to our attention as a severe problem in the winter of 1955-56. Reports were furnished to us through Mr. J. C. Alexander, who is our official state representative of Missouri, and through the U. S. Public Health Service in Mr. Hopkins' office.

MR. SAMSON: That is all I have right now. Thank you, Mr. Edelman.

Q. (By Mr. Edelman) What does the Corps of Engineers contemplate with regard to the future regulation on this part of the Missouri River?

A. Now, this is a very large project, very expensive, so there have been long-range planning studies made for many years. I have participated in them myself since 1943. All of these studies--and they go ahead to presumably predicting operation conditions in the year 2000, unless somebody changes the law--contemplate this seasonal pattern of releases:

Higher flows for seven or eight months of the year that we call the navigation season, lower flows during the winter or non-navigation season.

Now, there is one element of this basin program that is pertinent. The authorized program does include large-scale irrigation development in the upper basin. As the years go on, that will tend to reduce the flows that are available for the lower river. So during drier years or low flow periods in later years, our criteria will have to be scaled down some, we know. It can't exceed 7,600 second feet in the wintertime or perhaps 27,500 or 30,000 second feet in the summertime, somewhat lower than at present. Of course, the other side of the picture in wet years and when the reservoirs are full, we might be discharging to, oh, as much as 10,000 second feet higher than that, 40,000 in the summertime, possibly 15,000 or 20,000 second feet in the wintertime.

I should say that our present operations, and they will be carried largely to the future, these releases we make in the wintertime quite frequently, because of our power releases there, are intervening flows and the discharge at Kansas City actually is in the range of 10,000 cubic feet per second to 20,000 cubic feet per second. This 9,600 I mentioned is the minimum. Usually two or three times a year, because of ice formation between the lowermost dam and Kansas City stopping the water, we do fall to that minimum and I anticipate that will continue for the future.

Q. Does the Corps of Engineers have any plans with regard to the regulation of the Kansas River?

A. Yes, there is an authorized comprehensive plan in development for flood control and other purposes in the Kansas River Basin. That authorized plan as presently authorized includes a total of eighteen flood control and multiple-purpose reservoirs. Seven of these are authorized for construction and operation by the Corps of Engineers, eleven are authorized for construction and operation by the Bureau of Reclamation. These reservoirs were planned for coordinated system operation and are so authorized, and suitable arrangements have been worked out between the Corps of Engineers and the Bureau for coordinating their operation.

Now, of these eighteen reservoirs that were authorized, ten are now completed and in operation. They are practically all in the central or western part of the Kansas Basin and have very minor effects on the flow of the Kansas River at the mouth.

There are three major reservoirs in the authorized plan on the lower basin, which will have quite a substantial effect on flows of the Kansas River at the mouth. One of those is under construction now and two are about to go under construction.

Now, as to the effects of these reservoirs on flows, the total system when completed will control some 85 percent of the drainage area of the Kansas River at the mouth, so they will exercise a high degree of control. The primary purpose for which these reservoirs will be operated--I should say purposes--are flood control and, for the reservoirs in the central and western basin, irrigation.

I should also mention that for the larger reservoirs in the lower basin arrangements are now being worked out for provision of storage for low flow regulation on the main stem of the Kansas River. These arrangements are not finalized yet; they are in the process of negotiation and being worked out.

Q. Are you familiar with the low flow figures for the low part of the Kansas River in the Kansas City area?

A. Yes. Historically the flows of the Kansas River vary quite radically, of course, because of the variability of the climate and the weather conditions, but mean flow, for instance, of the Kansas River for all time since records were collected, starting in 1917, average 6,500 cubic feet per second. That is of the Kansas River at Bonner Springs, which is a gauging station twenty miles above the mouth.

To look at minimum discharges, though, on October 11, 1956, for instance, the extreme low flow recorded there for one day was 160 cubic feet per second. Now, as to how frequently low flows like that might be expected, there have been two main drought periods shown in the record that had low flows on the Kansas River. One was in the years 1934 through 1941; the other one was in 1953 through 1956. The extreme low flow during the first of these droughts was 260 cubic feet per second in February 1939 and monthly average discharge was below 600 second feet for several months, to be specific from October 1939 through January 1940, and much lower than normal for the whole period of the drought.

In this recent drought, I have already mentioned the extreme low flow of 160 cubic feet per second. For a longer example, the discharge at Bonner Springs was below 500 cubic feet per second practically all of the time from late September 1956 until early February 1957. Discharges of less than 1,000 second feet have been quite frequent in the record. Discharges of less than 500 or 600 second feet have been experienced months at a time in these low flow periods.

Q. At what level does the Corps contemplate establishing a minimum low flow in the Kansas River?

A. That is part of the subject that is under negotiation now. Specifically, we have been requested by the State of Kansas to dedicate certain storage capacity and certain of the lower basin reservoirs. Tuttle Creek, for instance. Milford and Perry is approaching for negotiation for conservation usage, among other purposes to be for general increase in low flows in the Kansas River. We can't say right now exactly how much the flows will be raised, but we have made definite studies of what the potentialities are, what the capabilities are of these reservoirs.

This first reservoir that will be completed, Tuttle Creek, while serving its flood control job does have the capability of assuring a minimum flow at Bonner Springs of 750 cubic feet per second. The whole system operated, as I best could visualize it and still leaving flood control and irrigation in the picture, could regulate the flow at Bonner Springs up to 1,100 cubic feet per second. Now, whether or not these potentialities will ever be realized depends on a lot of arrangements being worked out and a lot of financial participation on local--in accordance with federal flood control and multiple-purpose law.

Q. But this is what you would reasonably expect the system, if fully constructed, to provide, up to a maximum of about 1,100? That would be the optimum figure?

A. Yes. And I feel myself, it is just from experience with things as they are developing, that that should happen within the next ten to twenty years, we should see the flow regulated to somewhere between 750 to 1,000 second feet at Bonner Springs.

Q. Mr. Pafford, can you tell us what the basic general policy of the Corps of Engineers is with respect to using water collected by the systems you have described as a means of furnishing dilution to alleviate conditions created by water pollution in this area of the river?

A. The basic general policy of the Corps of Engineers on this subject, I am speaking of the Corps nationally as well as our division in the Missouri River Division, is that low flow regulation for sewage and industrial waste dilution generally should not be used as a substitute for treatment works.

MR. EDELMAN: That is all we have, Mr. Chairman.

MR. JOHNSON: Could I ask a question, please? Do you have any estimate of what the complete cost of this whole system would be when done?

A. Reservoir system? The main-stem reservoir system on the upper Missouri River I referred to will cost somewhat over one billion dollars. The Kansas River system will be several hundred million dollars, I don't remember the exact figure.

MR. JOHNSON: Thank you.

MR. POOLE: I have a question, Mr. Chairman.

CHAIRMAN WILSON: May we first permit cross-examination by counsel, gentlemen?

MR. POOLE: All right.

CHAIRMAN WILSON: I think we understood that the members of the Board would reserve their questions until the counsel was through.

The government is through with this witness now, I understand?

MR. EDELMAN: Yes, sir.

CHAIRMAN WILSON: Does counsel for the City of Kansas City, Missouri, have any questions?

Kansas City, Kansas?

MR. POWERS: Yes, Kansas City, Missouri, if you please.

CHAIRMAN WILSON: Kansas City, Missouri. All right.

CROSS-EXAMINATION

BY MR. POWERS:

Q. Mr. Pafford, what is the area of the flood plain of the flood basin of the Kansas River?

A. Do you mean the total drainage area, sir, or the--

Q. That is correct.

A. The total--

Q. You deal in total drainage area, do you not?

A. Yes, that is all of the basin from which water comes. The area is 60,060 square miles.

Q. What is the population of that area?

A. That I don't have the figures on, sir.

Q. There are a large number of cities in that basin, are there not?

A. Yes. The population is certainly several hundred thousand, but I don't know the exact population.

Q. All contributing more or less sewage or other pollution, is that correct?

A. The ones I know of personally, sir, have sewage treatment in the towns I visited personally.

Q. Now, the policy of the engineers, you say, is to not use the water for dilution of any sewage that may be placed in the river, but to use it in reservoirs for irrigation, and so on, is that correct?

A. I stated the policy was against use of water for dilution as a substitute for treatment works. Now, after treatment, as I know of it anyway, there are still some substances that need a small degree of dilution, at least we hear about it plenty in the reservoir operating business, but the amount of water needed there is much, much less than for untreated sewage. And the reason for this policy, I might mention, is the extremely high cost of the reservoirs and delivery of this water from the reservoir system and the relatively low benefit, if you want to call it that, as compared to other uses, for power or irrigation.

Q. Well, do I understand that you would put the retention of water for power or flood control or irrigation above the discharge of water for the protection of public health?

A. Sir, any of our improvements we make surveys of first. One thing we have to find is a finding of economic justification or a finding of economic feasibility. In the Kansas Basin itself I am familiar with studies that have been made of what would be the benefit for stream flow dilution, with the alternate source considered treatment, as compared to what would be the cost of delivering water from the reservoirs. I can assure you that the benefits, considering the water delivered in lieu of treatment works, are much smaller than the costs of storing water in even our lowest-cost reservoirs. It is an economic proposition.

Q. Well, cost to whom?

A. To the--

Q. The federal government or to the communities that pay the bill?

A. Total cost, sir, regardless of money, total public cost.

Q. So you haven't separated that cost between the cost that would be imposed upon the local communities and the cost upon the federal government?

A. In the end in recommending a project we recommend specific federal costs, but in analyzing our improvements we consider total costs and total benefits to whomsoever.

Q. And so you are placing the matter of discharging of water into the river, the Kansas River particularly, on an economic basis, is that correct?

A. All of our improvements are required to be economically justified as a matter of federal law. We make no distinction in the Kansas Basin.

Q. Now, your policy as to the upper Missouri River is to also retain as much water as possible for the benefit of the upper river inhabitants in the matter of irrigation and power, and so forth, that is your policy at the present time, is it?

A. The policy is general benefit for the entire Missouri Basin region. As I mentioned, the functions to be served primarily under law are flood control, which certainly is lower basin as well as upper basin, navigation, which is more lower basin than upper basin, irrigation, which is more upper basin than lower basin, and power, which is predominantly upper basin. But the general policy is the greatest general benefit to the greatest number of people in the Missouri Basin.

Q. And that is in your own opinion?

A. That is correct.

Q. And you will follow the opinions of Congress as to the distribution of this water, I take it?

A. That is, and our operations are, in conformance with federal law.

Q. And you cannot say what Congress will do in changing the policy as to who gets the water, whether the upper river basin gets it or whether the lower basin gets it?

A. That actually is--that is a matter for Congress, sir.

MR. POWERS: That is all. Thank you.

CHAIRMAN WILSON: Any other questions by counsel for parties?

MR. BRENNEISEN: Yes.

CROSS-EXAMINATION

BY MR. BRENNEISEN:

Q. Mr. Pafford, you testified that tests for the Kansas River flow are made at Bonner Springs, Kansas?

A. That is correct, sir.

Q. How many river miles is Bonner Springs from the mouth of the Kaw, mouth of the Missouri?

A. To be precise, it is 20.8 miles, sir.

Q. Do you know approximately how many river miles the Kansas River flows through the metropolitan area of Kansas City, approximately?

A. It would be at least half of that mileage, sir.

Q. About half of that. Is it true that part of the time the flow of the Kansas River in the area of Kansas City is at a standstill, that is that there is no flow at all from the backing up of the Missouri River?

A. I have heard that when flows on the Kansas River are very low and there is a sudden rise on the Missouri River that there is a tendency for no flow to come out of the Kansas River. I have not observed that, but I have heard it from what I consider reliable authority. That is only temporary and intermittent, though.

MR. BRENNEISEN: That is all.

CHAIRMAN WILSON: Any other questions by counsel for parties?

Do any members of the Board have any further questions?

MR. POOLE: I have a little clarification.

Q. (By Mr. Poole) This Tuttle Creek reservoir you said could raise the flow to 750 cubic feet per second here at Kansas City. My question is, has the agreement or the negotiation proceeded to the point where we can assume that hereafter there will be a minimum flow of 750 or thereabouts?

A. I would say that you can be reasonably assured that that will come about, but you cannot assume it as a positive fact because the detailed final regulation plans, I mean operation plans, for Tuttle Creek reservoir are not formalized or finalized yet. It is reasonably assured, but not certain.

CHAIRMAN WILSON: Any other questions by members of the Board?

Q. (By Mr. Ridge) You testified, I believe, that there were eighteen reservoirs in that Kansas system. Could you give us any idea of the cost allocation that would be necessary to hold this minimum flow, what part of the cost of those reservoirs would be allocated for that purpose?

A. At Milford reservoir, which is the only one I recollect the figures on, approximately 30 percent of the total cost of the reservoir would be allocated to the storage the state has requested to provide this minimum flow. I remember that because it is a matter of law that it cannot exceed 30 percent and that comes very close to reaching the 30 percent allocation.

Q. What I am trying to get at is what the cost of providing the low flow is on the Kansas in total?

A. I don't recollect the figures.

Q. What it will be?

A. I don't have them with me, sir. We have figures on it, but I don't have them with me and I don't recollect it.

MR. RIDGE: That is all I have.

CHAIRMAN WILSON: Any other questions?

Q. (By Chairman Wilson) Mr. Pafford, in order to clear up our understanding of the authority of the Corps of Engineers, both in this matter of determining the economic justification for these large river control projects in advance and also in determining your policy with reference to the exercise of that control after the projects are constructed, I would like to ask you a few questions. You have indicated that the primary purposes of these large projects are for flood control, irrigation, navigation and hydroelectric power production. Those are the primary purposes, are they not?

A. Of the main reservoirs of the river, yes, sir, they are.

Q. And are those purposes determined by the acts of Congress authorizing these projects?

A. This Flood Control Act of 1944 that I mentioned adopted some documents which were recommendations of the Corps of Engineers through the Chief of Engineers of the Bureau of Reclamation through the Secretary of Interior for plans for improvement of the Missouri River Basin. Those plans recommended these upper Missouri River reservoirs for these specific purposes I mentioned, the flood control, irrigation, navigation and power. Then the Flood Control Act of 1944 adopted--this is practically a quotation--expansion of the comprehensive plans of the Missouri Basins as proposed in these documents. The documents were Senate Document 247, House Document 412, and Senate Document 181.

Q. Is there anything in the enabling legislation that authorizes you, the Corps of Engineers, in determining the justification for these projects to take into consideration the resulting benefits with respect to any other purposes, for example the dilution of sewage or industrial waste or water supply or the public recreational uses of the rivers?

A. We undertake investigations in planning under either specific language of specific acts or under resolutions of the Public Works Committees of the Senate or House of Representatives which usually tell us to investigate some locality, for instance the Kansas River Basin, for flood control and other purposes. In the process of our investigations we are free to consider any use of water for any purpose. We hold public hearings and consult with interested people to find out any purposes in which they might be interested and do make studies to see if it would be, one, physically possible and, two, economically feasible to supply water for those purposes. Then we end up with these recommendations and these agency reports which are sent to the Congress and the ordinary authorization by Congress is a specific act of Congress approving the plans outlined in such-and-so document, which is a recommendation of the agency. So during the investigation phase we are free to consider use of water for any purpose and do consider it for any purpose that appears to be worth-while and is requested by the people interested in the area.

Once the program is authorized, though, in terms of a specific plan outlined, recommended for specific purposes, then the authorization, in effect, binds the use of those projects to the purposes for which they were proposed. Do I make it clear to you, sir?

Q. Yes. Well, then, of course, the final outcome is that the policy of the Corps of Engineers is controlled by the authorizing legislation for these projects as constructed, no matter what was authorized with reference to the preliminary investigation?

A. That is right. The final construction is authorized in accordance with a specific proposal and the operation has to be in consonance with that unless there is a--because actually the legal status is practically always "be constructed and operated" and that is what they authorize funds to be used for, construction and operation. So then there would have to be change in Congressional authorization afterwards to permit use or operation of the projects in another manner than they had been originally proposed.

Q. With reference to the Missouri River project, you have already testified that to some extent you have made allowance for the use of water for sewage and waste dilution under extreme conditions?

A. Let me clarify that.

Q. May I just follow that up?

A. All right.

Q. What I am asking is, in view of your statement as to the primary purposes of these projects, by what authority did you make that allowance of the use of water or the control of water for sewage and waste dilution?

A. Let me explain that. I say the primary purposes, I mean the purposes from which benefits were evaluated to weigh against the cost. Conditions for which we would--I mean purposes or functions for which we would improve conditions were flood control, irrigation, navigation and power; they collectively had sufficient benefits to more than offset the cost of this project up here. But a person can't just move a project in on a river like that and, for instance, absolutely stop flow and allow no water to go down the river for other purposes. So our operation has been, let's say, a negative benefit. Let's make conditions no worse. There weren't sufficient benefits to justify making things better for sewage--I mean for dilution of wastes on the river. The fact of the matter is there isn't enough water to make them better, but still we couldn't just move in and just absolutely ignore water supply down the river. So what we have done is try and maintain the status quo. In other words, as a person would move in anywhere, there are certain established uses you just can't absolutely ignore.

Q. In other words, even though the acts of Congress required these projects to be constructed for certain definite purposes, you were under a basic obligation to permit at least the minimum flow to pass downstream so that people might have the benefit of whatever that would provide?

A. That is the way we have regarded it, sir. We weren't obligated, in fact it would be prohibited, from providing any greater beneficial service unless certain costs of the projects were allocated towards that, but certainly no reasonable person would just absolutely ignore the use of a river for an important purpose like water supply.

Q. Is there any affirmative authority under the acts of Congress for considering any other uses of the river than those that you have mentioned, that is sewage and waste dilution and water supply? I am referring particularly to public navigational use of the rivers for recreational and related purposes. You mentioned in your testimony here a while ago that you had had some communication from the State of Kansas about using the waters for conservation purposes. What did you have in mind about that?

A. Primarily as a source of sustained low flow in streams as a water supply for industry and for municipalities and for direct use from the reservoir for municipalities or industry. Now, to go back, I mentioned primary purposes on these reservoirs up the river. We do recognize certain secondary purposes up there, such as recreational use, fish and wild life development, which are very fine as long as they do not interfere with service to the primary functions. Legally we could not, for instance, cut down power production or cut down on flood control storage just for the benefit of recreation, but to the extent we can operate for the primary purposes and give help also for recreation or fish and wild life purposes, that is very legal and it is so proposed in the basic plans.

We did not propose stream flow increase for stream sanitation on the Missouri River at the time of the preparation of the basic plans in which I participated, primarily because there were not sufficient monetary benefits to warrant the cost.

Q. Well, in other words, what you are able to do for the benefit of sewage dilution, water supply or public recreational use is secondary to the primary objects for which these projects have been authorized?

A. That is correct, sir.

CHAIRMAN WILSON: Any other questions?

MR. POOLE: I have one more, Mr. Chairman.

Q. (By Mr. Poole) This 7,600 second feet you referred to on the Missouri at Kansas City, which was later changed to 9,600, I am not familiar with your gauging points, is that above the confluence of the Kansas River or below the confluence of the Kansas?

A. That is at the official Geological Survey gauging station, which is about a mile below the mouth of the Kansas River.

Q. In other words, that does include the flow of the Kansas River?

A. That includes the flow of the Kansas River.

MR. POOLE: Thank you.

CHAIRMAN WILSON: May I ask just one more question, Mr. Pafford?

Q. (By Chairman Wilson) You have observed these rivers both before and since the present control projects went into operation?

A. Yes, sir, I have.

Q. And generally speaking, what has been the effect of these control projects on the effect of these rivers in carrying away either sewage or industrial waste? I suppose that before these projects went into operation, in order to make clear the purpose of my question, that before then you had extreme variations in the discharge of these rivers, did you not?

A. There was much more variation in the discharge of the rivers before than afterwards. The effects of these projects, both on the Missouri and on the Kansas, is to cut down the flood peaks of high flows, slightly reduce the middle ground and to firm up the low flows, so that the fluctuation in discharges is greatly reduced, particulary on the Missouri River.

Q. Then under natural conditions when you had these extreme high flows, I suppose that at those times they had some effect in scouring out the channel and carrying away accumulations of waste that you would not have now when there has been a greater evening up of the high and low discharges?

A. I know that is certainly true with respect to sediment and sand on the river, with which I am familiar. With respect to any waste deposit or something, I am not personally familiar with that, sir.

CHAIRMAN WILSON: Any other questions at this time?

If not, I think we will take a recess.

SECRETARY AYERS: Mr. Ridge.

CHAIRMAN WILSON: Excuse me.

MR. RIDGE: I have just two short ones for the record.

Q. (By Mr. Ridge) As I gather, then, there was no cost allocation to the upper Missouri dams for low water purposes other than navigation?

A. And hydropower generation as it is involved secondarily, but no other purposes. The cost allocations specifically were to flood control, irrigation, navigation and power, and a very small allocation to recreation.

Q. If that had been made, would that be reimbursable?

A. That is a difficult question to answer. If we were to provide storage now under Title 3 of the Flood Control Act of 1958, which allows us to increase the storage capacity of a flood control reservoir to provide conservation storage, that would be reimbursable by some non-federal interest.

MR. RIDGE: That is all.

CHAIRMAN WILSON: We have run a few minutes over the noon hour. We will take a recess until 1:40 this afternoon.

- - - -

WHEREUPON, the hearing stood at noon recess until the hour of 1:40 o'clock in the afternoon, at which time the following further proceedings were had and entered of record, to-wit:

AFTERNOON SESSION, MONDAY, JUNE 13, 1960

CHAIRMAN WILSON: The hearing will be in order.

I am told that there is an appearance in behalf of the Bendix Aviation Corporation, which is listed as one of the responsible parties. Is someone appearing for that corporation? Just give your name and position to the reporter, please.

MR. GRINER: R. R. Griner, Manager of the Facilities Engineering.

CHAIRMAN WILSON: Are there any other parties?

MR. FOSTER: Robert Foster.

CHAIRMAN WILSON: Are you for the same company?

MR. FOSTER: Right.

CHAIRMAN WILSON: Very well.

MR. FOSTER: Robert Foster, Manager of Health, Safety, Fire Protection.

CHAIRMAN WILSON: That appearance will be noted.

Are there any other parties listed in the notice as responsible who did not appear this morning who now wish to enter an appearance?

MR. WALLACE: The National Laboratory Corporation, M. F. Wallace.

CHAIRMAN WILSON: Any others? Did you give your name and address to the reporter?

MR. WALLACE: I gave my name.

CHAIRMAN WILSON: And your position?

SECRETARY AYERS: What is your position, please, Mr. Wallace?

MR. WALLACE: President.

SECRETARY AYERS: The president?

MR. WALLACE: That is right.

SECRETARY AYERS: Thank you.

CHAIRMAN WILSON: Mr. Griner, did you indicate an appearance in behalf of someone else besides Bendix?

MR. GRINER: Definitely not.

CHAIRMAN WILSON: One of the members got the impression that you did.

Now, are there any other appearances by parties to the notice?

Very well. Then there have been applications made for admission as parties by the Chamber of Commerce of Kansas City, Kansas, and the Chamber of Commerce of Kansas City, Missouri, and by approval of the Board both of those organizations are admitted as interested parties and will be permitted at the proper time to present evidence and make statements.

Are there any others who wish to apply for permission to be listed as interested parties? If so, at any time they may file their applications with the Secretary and they will be considered by the Board.

Now, Mr. Hopkins, the Regional Engineer, informs me that plans have been made to secure a larger boat for the expedition tomorrow morning and the party will plan to leave the Pickwick Hotel at about 8:40 so as to be down at the dock at 9 o'clock. I assume that all this is weather permitting and I will suggest that somebody on the staff keep track of the weather reports so as to determine whether or not we are likely to be able to have favorable weather, because if it should be so that we couldn't take that trip then we would want to come back up here and resume the hearing. So if you will let us know about that at the recess time this afternoon, then we can make our plans accordingly.

You may proceed, Mr. Stein

MR. STEIN: Mr. Clare.

Mr. Chairman, at this point before we begin asking Mr. Clare questions, I believe we had a bench conference concerning the Atchison, Topeka and Santa Fe Railroad and another representative of North Kansas City who may have short statements to put in the record at this time or motions to make. If that would be in order, we would have no objection to their making them.

CHAIRMAN WILSON: Oh. Very well, if there are any parties now who wish to make statements or motions for the record, they will be entertained.

MR. REEVES: If the Board please, the purpose of this statement is merely to state the position of this party, which is the Atchison, Topeka and Santa Fe Railway Company, and we would have nothing further to offer in this record beyond the statement of position.

CHAIRMAN WILSON: Your appearance has already been noted?

MR. REEVES: My name has been noted. I am J. B. Reeves, attorney for the railway company.

Mr. C. H. Sandberg, Chief Engineer of the Eastern Lines of the Atchison, Topeka and Santa Fe Railway Company has authorized a statement of this position.

If the discharge from the sewer lines of the Atchison, Topeka and Santa Fe Railway Company in the vicinity of Kansas City, Kansas, are determined by this Board to result in objectionable pollution of the water of the Kansas River, and if this Board further determines that abatement of the same is required or should be effected, then in that event we would request that this Board give the railway company a reasonable length of time of not less than six months after the completion of the Kansas City, Kansas, sewer system and treatment facilities within which to lay our necessary sewer lines and connect to the same.

CHAIRMAN WILSON: That statement will be noted.

Do any other parties wish to make motions or statements at this time?

MR. SCHLUP: I am Truman Schlup. I was handed this statement to present to the Board on behalf of the Kaw Valley Drainage District. Mr. R. D. White, their president, had to leave the meeting. Is it the pleasure of the Board that I read the statement or simply file it?

CHAIRMAN WILSON: If there are no objections. Do I hear any objections?

If not, you may proceed.

MR. SCHLUP: "Before the Department of Health, Education and Welfare, Public Health Service, United States of America.

"In the matter of water pollution, control of interstate waters in the Kansas Cities Metropolitan Area and notice of public hearing thereof set for June 13, 1960.

"Statement of the Board of Directors of the Kaw Valley Drainage District, a public corporation of Wyandotte County, Kansas.

"Board of Directors of the Kaw Valley Drainage District, consisting of Roy D. White, President, 1031 Custer Avenue; O. F. (Jack) Smith, Vice-President, 3301 Strong Avenue; and Cyrus W. Long, Secretary-Treasurer, 836 South Baltimore Avenue, all of Kansas City, Kansas, having been served with a notice of a public hearing to be held before a Hearing Board of the Department of Health, Education and Welfare, Public Health Service, on water pollution control on Monday, June 13, 1960, at 9 o'clock a.m. of said day at the Appeals Courtroom, 6th Floor, United States Courthouse, 811 Grand Avenue, Kansas City, Missouri, hereby make the following statement as to their position on the above matter, to-wit:

"The Kaw Valley Drainage District is a body corporate and politic and was organized pursuant to Chapter 24, Article 4, of the General Statutes of Kansas, which was passed by the Kansas Legislature in 1905 following the disastrous floods of the Kansas and Missouri Rivers and their tributaries in 1903, empowering said drainage district, namely, to provide flood protection for the low areas within such districts susceptible to floods during seasons of high water, such district exercises exclusive control subject to the superior jurisdiction of the United States over navigable waters of the beds, channels, banks and all lands, the title to which is vested in the State of Kansas and which lie within the banks at high water mark of the Kansas River and within the confines of its district.

"The Kaw Valley Drainage District, in providing flood protection, is empowered to construct dikes, levees, pumps and flood gates and to provide other facilities necessary to flood protection. It operates pumps and flood gates and supervises sewers and outlets that are constructed through its dikes and levees to reach the river.

"The district itself does not operate or maintain any sewers, either storm or sanitary, but only operates pumps and flood gates in relation thereto in conjunction with the operation of such sewers by the City of Kansas City, Kansas, and by private industries. The responsibility of providing sewers, sanitary and storm, is the responsibility of the city and private industries, whose businesses are located close to the river and both of whom require such outlets to the river and the drainage district does not exercise any control over such sewer facilities except in the operation of pumps and flood gates as an accommodation and pursuant to agreement with private interests and the City of Kansas City, Kansas.

"Through the years the Kaw Valley Drainage District has cooperated with the city and private interests in permitting them to construct outlets through its dikes and levees, but the district itself is not charged with the responsibility of discharging nor does it discharge or cause to be discharged into the Kansas or Missouri Rivers any water, foreign substance, sewage or waste which would pollute or tends to pollute either of said rivers in Kansas City or elsewhere downstream, and is not charged with the operation of such sewer facilities but only exercises control over pumps and gates as aforesaid in order that maximum protection can be given by those facilities during high water.

"The drainage district is willing to and will cooperate with the City of Kansas City, Kansas, in its effort to comply with federal laws dealing with the abatement of such pollution as may occur in the Kansas and Missouri Rivers in the Kansas Cities Metropolitan Area, in so far as such cooperation can legally be extended and in so far as the law may require the drainage district so to do, in so far as its duties are concerned under the law as an organized drainage district."

This is submitted by the Board of Directors of the Kaw Valley Drainage District, Roy D. White, President, O. F. (Jack) Smith, Vice-President, Cyrus W. Long, Secretary-Treasurer.

CHAIRMAN WILSON: There being no objection, the statement will be received and you may leave a copy with the reporter.

Any further motions or statements? If not, the government may proceed.

HERBERT C. CLARE,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. STEIN:

Q. May we have your name and address?

A. My name is Herbert C. Clare. My residence is 4812 West 64th Street, Mission, Kansas.

Q. By whom are you employed?

A. I am employed in the regional office of the U. S. Public Health Service.

Q. What position do you hold?

A. I am Regional Program Director of the Water Supply and Pollution Control Program.

Q. How long have you been employed by the Public Health Service?

A. I have been on active duty in the Public Health Service five years.

Q. Generally what are the duties of your position?

A. I help in the development of comprehensive water pollution control programs, taking into consideration the many water uses; conservation of water quality, improvement of water quality for fish and wild life propagation, for recreation, its use for agriculture and industry as well as other legitimate uses. I also help with the joint investigations of water supply and water pollution control problems within the states in this region and carry on cooperative activities with the states and other agencies on water pollution problems, especially in connection with prevention and control of pollution.

Q. By whom were you previously employed?

A. I was previously employed by the State of Idaho Department of Public Health.

Q. In what capacity?

A. I was State Sanitary Engineer.

Q. For how long?

A. Eighteen years.

Q. In general what were your duties in that position relating to water pollution control?

A. I was in charge of the water pollution control program for the state.

Q. Have you had any special education or training in the field of water pollution control or sanitary engineering?

A. Yes, I have had a year of graduate work in sanitary engineering at Harvard University.

Q. How about your undergraduate work?

A. My undergraduate work was in chemical engineering at the University of Idaho. I have a professional degree in chemical engineering from that university. I have a Master's Degree in chemistry and a Master of Science in Sanitary Engineering.

Q. As part of your duties have you familiarized yourself and inspected Turkey Creek Sewer, the Kansas River and the Missouri River in and below the Kansas City area?

A. Yes, I have.

Q. Are you familiar with waste discharges from the persons named in the notice of this hearing? Have you familiarized yourself with the places they discharge their wastes?

A. Yes, I have.

Q. And the type and volume of the wastes?

A. Yes, sir.

Q. Have you as part of your records maps and photographs of the places covered by you in your investigation?

A. Yes, I do.

Q. I call your attention to a map purporting to cover the Kansas Cities Metropolitan Area.

MR. STEIN: I ask that for purposes of identification this be marked Government Exhibit No. 13.

(Government's Exhibit No. 13 marked for identification.)

Q. (By Mr. Stein) Does this map come from your official records?

A. Yes.

Q. Who prepared this map?

A. The maps originally were prepared by the U. S. Geological Survey. This is a composite of several topographical maps which have been matched and put together on one backing to show the metropolitan Kansas Cities area. Each of the components is a U. S. Geological Survey topog map.

Q. Would you describe that map generally and briefly, the content of the map?

A. Across the center of the map from left to right (indicating) is the Missouri River in its flood plain shown in white. In the center of the map (indicating) is shown the confluence of the Kansas River with the Missouri. The Kansas comes in from the lower left portion and flows in a generally easterly direction and then northerly to its confluence with the Missouri. The Kansas City area is, of course, built up around the confluence of the Kansas River with the Missouri.

Immediately north of the confluence is the Fairfax Industrial District. To the west and north, to the west, and to the west and south of the confluence is Kansas City, Kansas.

The state line follows the Missouri from the west edge of the map to the confluence with the Kansas River, from which point the state line goes south, separating Kansas City, Kansas, from Kansas City, Missouri. Kansas City, Missouri, then, is to the east of the lower part of the Kansas River and for the most part south of the Missouri River. I say for the most part, because part of Kansas City, Missouri, is north of the Missouri River.

Immediately north of the Missouri River below the confluence of the Kansas River is a separate city, North Kansas City. Surrounding North Kansas City on the west side and also on the north and down the east side is part of Kansas City, Missouri, generally known as Kansas City North.

The Blue River, one of the main tributaries of the Missouri in this metropolitan area, is shown on this map flowing in a generally northerly direction (indicating) from the lower right almost due north to its confluence with the Missouri River just above Independence and Sugar Creek, which are Missouri municipalities.

In the extreme upper right corner of the map will be seen the municipality of Liberty, Missouri.

Q. Mr. Clare, would you outline Turkey Creek Sewer on that map, please, if you can?

CHAIRMAN WILSON: Mr. Stein, before you go further, have you offered this map in evidence?

MR. STEIN: No.

CHAIRMAN WILSON: I think before the witness goes into any detail --I understood that he was just describing the general nature of the map. Before he goes into any detail about it, you had better offer it.

MR. STEIN: Right. We will offer this in evidence as Government Exhibit No. 13.

CHAIRMAN WILSON: Any objection?

Hearing no objection, it is admitted.

(Government's Exhibit No. 13
received in evidence.)

A. The Turkey Creek drainage--

CHAIRMAN WILSON: May I ask Mr. Clare a question before you proceed any further?

A. Yes.

CHAIRMAN WILSON: What part, if any, of the Kansas River touches upon or flows through the State of Missouri?

A. No part. The Kansas River is an intrastate stream.

MR. STEIN: Intrastate.

A. Intrastate stream.

CHAIRMAN WILSON: That is to say it is entirely within the State of Kansas?

A. That is my understanding, yes, sir.

CHAIRMAN WILSON: You stated a while ago that the interstate boundary came down the Missouri River and then took off to the south at the confluence and I wondered from that whether any part of the Kansas River at all was within the State of Missouri. You say it is not?

A. That is right. Only the point of confluence is in the State of Missouri and that is only one point.

The Turkey Creek drainage is shown in the lower left quadrant of this map. It flows from the lower left corner in a northeasterly direction and around the--across the state line into Missouri, around the point of the hill and back into Kansas and into the Kansas River. Now, that is the original channel of Turkey Creek. I think that we have an aerial photo that shows this more plainly.

Q. (By Mr. Stein) We will proceed with that in order.

A. All right. Several years ago, in fact--I think it was 1917--a part of this channel through Missouri and part of Kansas was covered and it is no longer exposed, I mean it is not an open channel in the lower portion at the present time.

Q. Mr. Clare, I call your attention to a map which is entitled "Metropolitan Kansas City Area Sewer Outfalls" and purports to indicate where every sewage outfall in the area finds its way to a water course. Is this map part of your official records?

A. It is.

Q. How was this map prepared?

A. This map was prepared in our office under my supervision from information that we got in the field, from consulting engineers' reports and from Corps of Engineers' Flood Emergency Plan. In other words, we used every source that we could find in preparation of this map.

MR. STEIN: We ask that this be marked as Government Exhibit No. 14 for purposes of Identification.

(Government's Exhibit No. 14
marked for identification.)

MR. STEIN: Now, because of the complex nature of this we have prepared sufficient copies of this map for the Board members and for counsel and perhaps some others, so that the testimony of Mr. Clare may be followed more clearly, and we would like to distribute the copies of the map at this time.

I might say that the problem with a metropolitan area of this kind is that there are many complex sewer outfalls and it does take some of these visual aids to try to get a picture of it.

CHAIRMAN WILSON: Do you offer Exhibit 14 in evidence?

MR. STEIN: We would like to offer this in evidence.

CHAIRMAN WILSON: Any objection?

MR. KOENIGSDORF: We haven't seen it yet.

CHAIRMAN WILSON: Let counsel see the exhibit.

MR. STEIN: Mr. Chairman, we offer this in evidence as Government Exhibit No. 14.

CHAIRMAN WILSON: We are waiting for the examination by opposing counsel.

MR. POWERS: Does this show Turkey Creek?

A. C-21 is the Turkey Creek outfall.

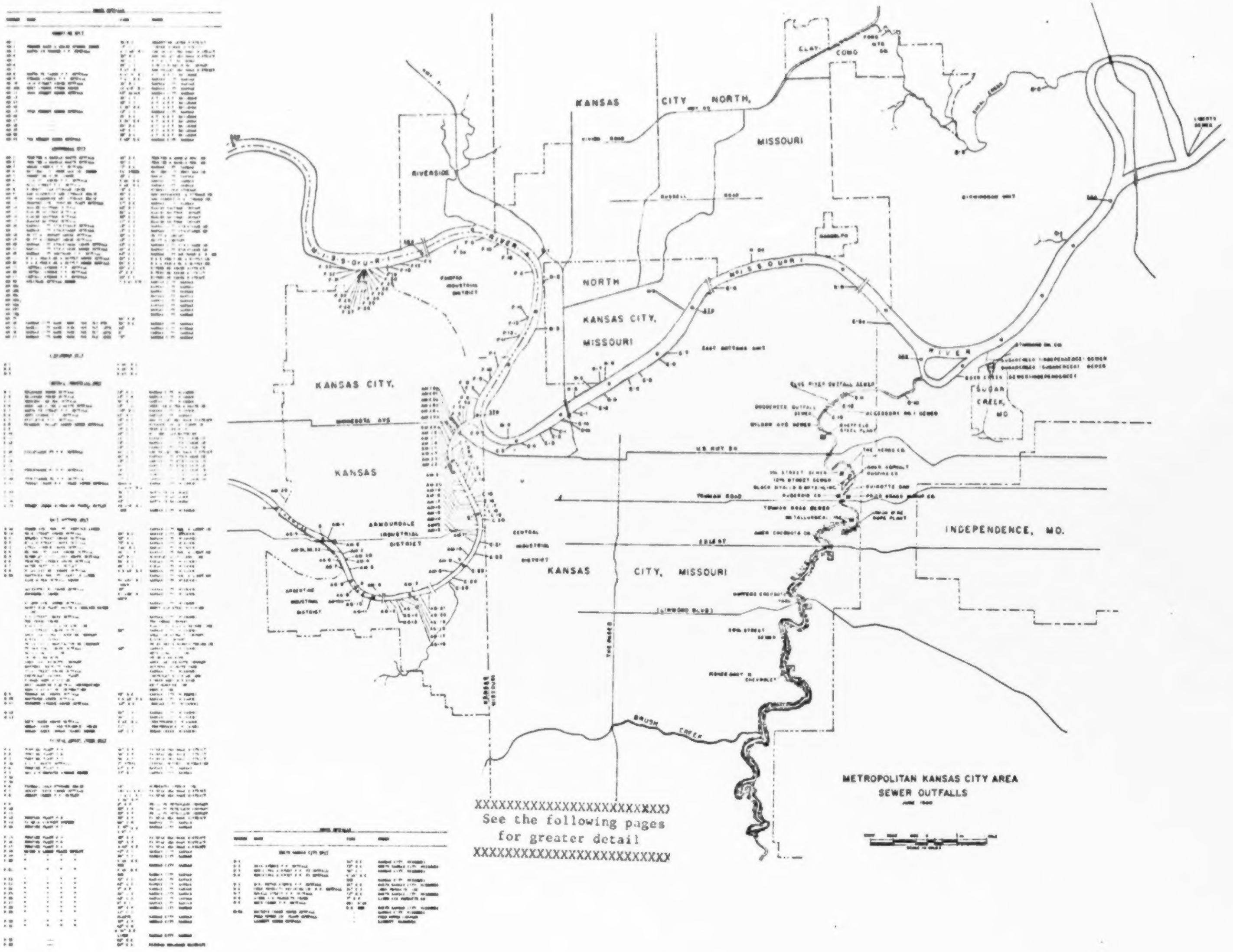
MR. STEIN: It shows the outfall. This map purports to show all outfalls.

CHAIRMAN WILSON: In both cities?

MR. STEIN: Yes, sir. North Kansas City too. The entire area.

MR. POWERS: It doesn't purport to show how that Turkey Creek outfall arose, does it?

Q. (By Mr. Stein) Mr. Clare?



XXXXXXXXXXXXXXXXXXXXXXXXX
See the following pages
for greater detail
XXXXXXXXXXXXXXXXXXXXXXXXX

METROPOLITAN KANSAS CITY AREA
SEWER OUTFALLS

70 b.

SEWER OUTFALLS

ARGENTINE UNIT

NUMBER	NAME	SIZE	OWNER
AG-1	---	36" R.C.	ARGENTINE LEVEE DISTRICT
AG-2	TURNER HIGH & GRADE SCHOOL SEWER	12" C.I.	TURNER SCHOOL DISTRICT
AG-3	SANTA FE-TURNER P.P. OUTFALL	2-5'x8' R.C.	KAW VALLEY DRAINAGE DISTRICT
AG-4	---	36" R.C.	KAW VALLEY DRAINAGE DISTRICT
AG-5	---	16" C.I.	A.T. & S.F. RAILROAD
AG-6	---	24" C.I.	SINCLAIR REFINING COMPANY
AG-7	---	9'x9' R.C.	KAW VALLEY DRAINAGE DISTRICT
AG-8	SANTA FE YARDS P.P. OUTFALL	6'x5.4' R.C.	A.T. & S.F. RAILROAD
AG-9	STRONG AVENUE P.P. OUTFALL	7'x7' R.C.	KANSAS CITY, KANSAS
AG-10	16th STREET SEWER OUTFALL	30" R.C.	KANSAS CITY, KANSAS
AG-10a	[illegible] AVENUE STORM SEWER	10'x10' R.C.	KANSAS CITY, KANSAS
AG-11	14th STREET SEWER OUTFALL	42" brick	KANSAS CITY, KANSAS
AG-12	---	36" C.I.	A.T. & S.F. RAILROAD
AG-13	---	30" C.I.	A.T. & S.F. RAILROAD
AG-14	---	2-30" R.C.	A.T. & S.F. RAILROAD
AG-15	10th STREET SEWER OUTFALL	12" C.I.	KANSAS CITY, KANSAS
AG-16	---	24" R.C.	A.T. & S.F. RAILROAD
AG-17	---	2-24" R.C.	A.T. & S.F. RAILROAD
AG-18	---	24" R.C.	A.T. & S.F. RAILROAD
AG-19	---	18" C.I.	A.T. & S.F. RAILROAD
AG-20	---	30" R.C.	A.T. & S.F. RAILROAD
AG-21	7th STREET SEWER OUTFALL	2-48" R.C.	KANSAS CITY, KANSAS

ARMOURDALE UNIT

NUMBER	NAME	SIZE	OWNER
AM-1	PROCTER & GAMBLE WASTE OUTFALL	30" R.C.	PROCTER & GAMBLE MFG. CO.
AM-2	PROCTER & GAMBLE WASTE OUTFALL	30" C.I.	PROCTER & GAMBLE MFG. CO.
AM-3	OSAGE AVENUE P.P. OUTFALL	72" R.C.	KANSAS CITY, KANSAS
AM-4	NATIONAL CYLINDER GAS CO. SEWER	14" STEEL	NATIONAL CYLINDER GAS CO
AM-5	ARGENTINE BLVD. SEWER	30" C.I.	KANSAS CITY, KANSAS
AM-6	12th ST. SEWER P.P. OUTFALL	5'x6' R.C.	KANSAS CITY, KANSAS
AM-7	HILL STREET P.P. OUTFALL	6'x8' R.C.	KANSAS CITY, KANSAS
AM-8	MIDWEST COLD STORAGE SEWER	18" C.I.	MIDWEST COLD STORAGE
AM-9	KAW WAREHOUSE AND STORAGE DRAIN	30" C.I.	KAW WAREHOUSE & STORAGE CO.
AM-10	KAW WAREHOUSE AND STORAGE DRAIN.	30" C.I.	KAW WAREHOUSE & STORAGE CO.
AM-11	[illegible] AVE. PUMPING PLANT OUTFALL	57" R C.	KANSAS CITY, KANSAS
AM-12	GLAZER KAUFMAN OUTFALL	48" R C	GLAZER KAUFMAN COMPANY
AM-13	GLAZER KAUFMAN OUTFALL	24" C.I.	GLAZER KAUFMAN COMPANY
AM-14	GLAZER KAUFMAN OUTFALL	30" C.I.	GLAZER KAUFMAN COMPANY
AM-15	GLAZER KAUFMAN OUTFALL	12" C.I.	GLAZER KAUFMAN COMPANY
AM-16	KANSAS CITY STOCKYARDS OUTFALL	12" C.I.	KANSAS CITY STOCKYARDS CO
AM-17	KANSAS CITY STOCKYARDS OUTFALL	12" C.I.	KANSAS CITY STOCKYARDS CO
AM-18	SWIFT & COMPANY SEWER OUTFALL	30" C.I.	SWIFT & COMPANY
AM-19	SWIFT & COMPANY SEWER OUTFALL	12" C.I.	SWIFT & COMPANY
AM-20	KANSAS CITY STOCKYARDS SEWER OUTFALL	12" C.I.	KANSAS CITY STOCKYARDS CO
AM-21	KANSAS CITY STOCKYARDS SEWER OUTFALL	16" C.I.	KANSAS CITY STOCKYARDS CO
AM-22	KANSAS CITY SOUTHERN P.P. OUTFALL	42" C.I.	KANSAS CITY SOUTHERN R. R. CO
AM-23	B & G WRECKING & SUPPLY SEWER OUTFALL	24" C.I.	B & G WRECKING & SUPPLY CO
AM-24	B & G WRECKING & SUPPLY SEWER OUTFALL	24" C.I.	B & G WRECKING & SUPPLY CO.
AM-25	CENTRAL AVENUE P.P. OUTFALL	24" C.I.	RIVERSIDE SEWER DISTRICT
AM-26	CENTRAL AVENUE P.P. OUTFALL	2" S.P.	RIVERSIDE SEWER DISTRICT
AM-27	CENTRAL AVENUE P.P. OUTFALL	10" C.I.	RIVERSIDE SEWER DISTRICT
AM-28	SPLITLOG OUTFALL SEWER	7.5'x7.5'R.C.	KANSAS CITY, KANSAS
AM-28a	---	-	KANSAS CITY, KANSAS
AM-28b	---	-	KANSAS CITY, KANSAS
AM-28c	---	-	KANSAS CITY, KANSAS
AM-28d	---	-	KANSAS CITY, KANSAS
AM-28e	---	-	KANSAS CITY, KANSAS
AM-28f	---	-	KANSAS CITY, KANSAS
AM-28g	---	-	KANSAS CITY, KANSAS
AM-29	---	66" C M	---
AM-30	KANSAS CITY,KANS. MUNC. PWR. PLT STD	84" R C	KANSAS CITY, KANSAS
AM-31	KANSAS CITY,KANS. MUNC. PWR. PLT. INTK	48"	KANSAS CITY, KANSAS
AM 32	KANSAS CITY,KANS. MUNC. PWR. PLT. INTK.	6"	KANSAS CITY, KANSAS
AM 33	KANSAS CITY,KANS. MUNC. PWR. PLT. INTK	72"	KANSAS CITY, KANSAS

BIRMINGHAM UNIT

NUMBER	NAME	SIZE	OWNER
B-1	---	6'x6' R C	---
B-2	---	6'x6' R C	---
B-3	---	6'x5' R C	---

CENTRAL INDUSTRIAL UNIT

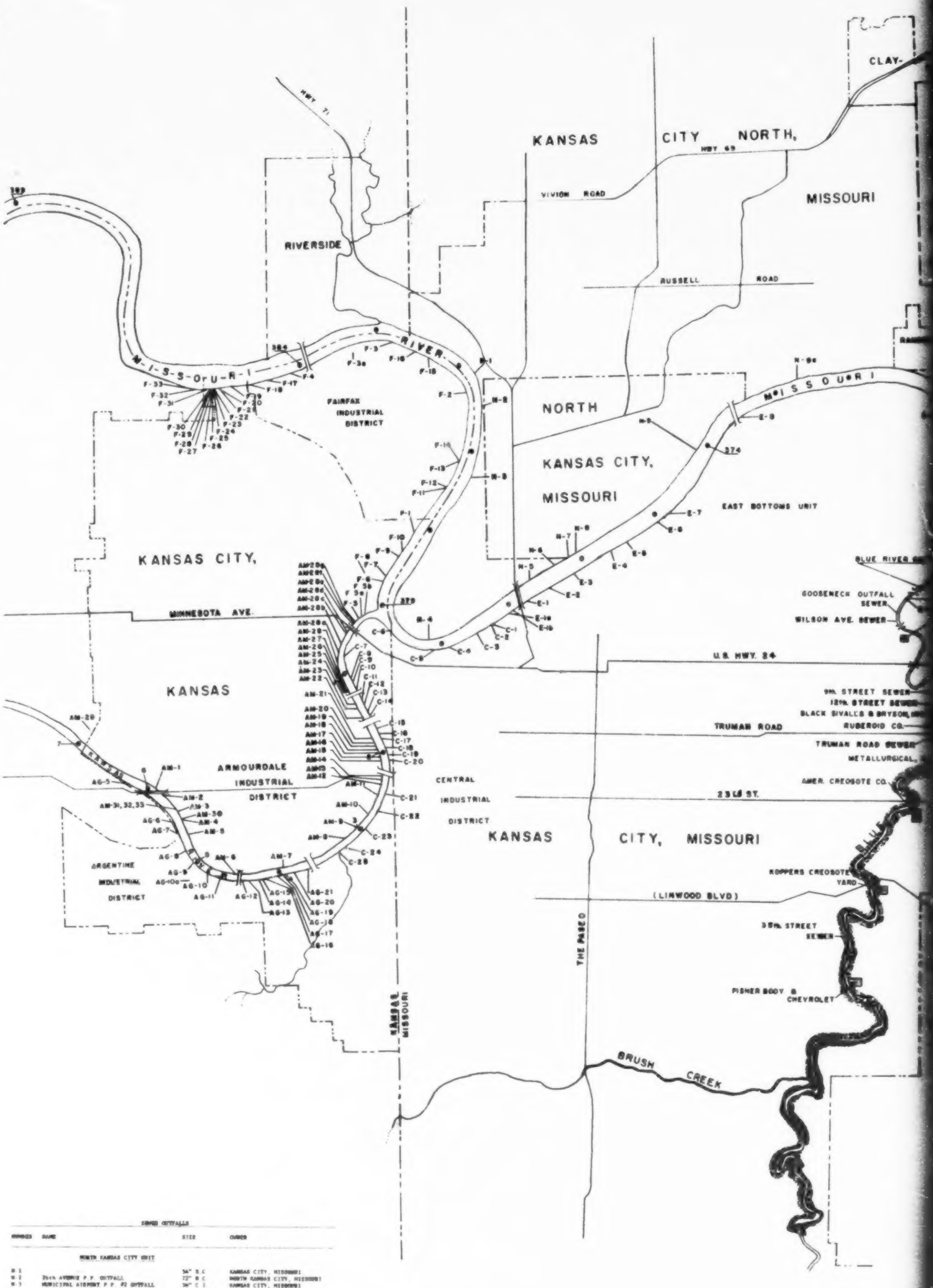
NUMBER	NAME	SIZE	OWNER
C-1	DELAWARE SEWER OUTFALL	18" C I.	KANSAS CITY, MISSOURI
C-2	DELAWARE SEWER OUTFALL	12" C M.	KANSAS CITY, MISSOURI
C-3	BROADWAY BRIDGE OUTFALL	36" R C	KANSAS CITY, MISSOURI
C-4	AMERICAN WIPER & WASTE OUTFALL	12" C I	AMERICAN WIPER & WASTE CO.
C-5	SANTA FE STREET P.P. OUTFALL	120" R C.	KANSAS CITY, MISSOURI
C-6	OHIO AVENUE P.P. OUTFALL	42" R C	KANSAS CITY, KANSAS
C-7	MISTLETOE P.P. OUTFALL	18" C I	KAW VALLEY DRAINAGE DISTRICT
C-8	MISSOURI VALLEY SERUM SEWER OUTFALL	10" C I	MISSOURI VALLEY SERUM CO
C-9	---	10" C I	PEERLESS SERUM CO.
C-10	---	10" C I	NATIONAL LABORATORIES
C-11	---	12" C I	KANSAS CITY STOCKYARDS CO.
C-12	---	12" C I	KANSAS CITY STOCKYARDS CO.
C-13	---	[illegible] C I	KANSAS CITY STOCKYARDS CO
C-14	STOCKYARDS #3 P.P. OUTFALL	24" C I	KAW VALLEY DRAINAGE DISTRICT
C-15	---	24" C I	KANSAS CITY STOCKYARDS CO.
C-16	---	18" C I	KANSAS CITY STOCKYARDS CO
C-17	---	24" C I	KANSAS CITY STOCKYARDS CO
C-18	STOCKYARDS #1 P.P. OUTFALL	10" C I	KANSAS CITY STOCKYARDS CO
C-19	---	30" C I	KANSAS CITY STOCKYARDS CO
C-20	STOCKYARDS #2 P.P. OUTFALL	12" C I	KANSAS CITY STOCKYARDS CO
C-21	TURKEY CREEK-O.K. CREEK SEWER OUTFALL	Double 17'x10' R C	KANSAS CITY, MISSOURI
C-22	---	36" C I	SANTA FE RAILROAD
C-23	---	24" C I	SANTA FE RAILROAD
C-24	---	42" C I	SANTA FE RAILROAD
C-25	TURKEY CREEK DIVERSION TUNNEL OUTLET	20'x10' R C BOX	KANSAS CITY, MISSOURI

EAST BOTTOMS UNIT

NUMBER	NAME	SIZE	OWNER
E-1a	GRAND AVE. PWR. PT. SERVICE LINES	-	KANSAS CITY PWR. & LIGHT CO
E-1b	MAIN STREET SEWER OUTFALL	84" R C	KANSAS CITY, MISSOURI
E-1	HOLMES STREET SEWER OUTFALL	52" R C	KANSAS CITY, MISSOURI
E-2	GILLIS STREET SEWER OUTFALL	72" R C	KANSAS CITY, MISSOURI
E-3	LYDIA AVENUE SEWER OUTFALL	114" R C	KANSAS CITY, MISSOURI
E-4	KC PWR. PT. SAN. SEWER OUTFALL	24" C I	KANSAS CITY PWR. & LIGHT CO
E-5	SCHENLEY DISTILLERS SEWER OUTFALL	42" R C	SCHENLEY DISTILLERS, INC
E-6	PROSPECT AVENUE SEWER OUTFALL	84" R C	KANSAS CITY, MISSOURI
E-7	WATER DEPT. P.P. OUTLET	24" C I	KANSAS CITY, MISSOURI
E-8	MILWAUKEE RR. SEWER OUTFALL	2-6'x8' R C	KANSAS CITY, MISSOURI
E-8a	HAWTHORNE PWR. PT. SERVICE LINES	-	KANSAS CITY PWR. & LIGHT CO
	BLUE RIVER OUTFALL SEWER	9½'x8½' R C. ARCH	KANSAS CITY, MISSOURI
	ACCESSORY #1 SEWER OUTFALL	30"	KANSAS CITY, MISSOURI
	GOOSENECK SEWER	21'x20' R C ARCH	KANSAS CITY, MISSOURI
	WILSON AVE. SEWER OUTFALL		KANSAS CITY, MISSOURI
	SHEFFIELD PLANT WASTE & COOLING WATER LINES	-	SHEFFIELD STEEL DIVISION
	9th STREET SEWER OUTFALL		KANSAS CITY, MISSOURI
	THE VENDO SEWER		THE VENDO COMPANY
	BLACK, SIVALLS & BRYSON, INC		BLACK, SIVALLS & BRYSON, INC
	12th STREET SEWER OUTFALL	24"	KANSAS CITY, MISSOURI
	AMERICAN ASPHALT ROOFING COMPANY		AMERICAN ASPHALT COMPANY
	RUBEROID COMPANY	-	RUBEROID COMPANY
	PRIER BRASS MANUFACTURING COMPANY	-	PRIER BRASS MANUFACTURING CO
	TRUMAN ROAD SEWER OUTFALL	30"	KANSAS CITY, MISSOURI
	METALLURGICAL, INC	-	METALLURGICAL, INC.
	UNION WIRE ROPE	-	UNION WIRE ROPE
	AMERICAN CREOSOTE COMPANY	-	AMERICAN CREOSOTE COMPANY
	KOPPERS CREOSOTE YARD	-	KOPPERS CREOSOTE YARD
	35th STREET SEWER OUTFALL	-	KANSAS CITY, MISSOURI
	CHEVROLET ASSEMBLY PLANT	-	CHEVROLET DIVISION, GMC
	FISHER BODY DIVISION	-	FISHER BODY DIVISION
	WESTINGHOUSE ELECTRIC CORPORATION	-	WESTINGHOUSE, INC.
	BENDIX AVIATION CORPORATION	-	BENDIX, INC
E-9	TRUMAN RD. SEWER OUTFALL	52" R C	KANSAS CITY, MISSOURI
E-10	HAWTHORNE SEWER OUTFALL	2-6'x8' R C	KANSAS CITY, MISSOURI
E-11	GARDNER AVENUE SEWER OUTFALL	42" R C	KANSAS CITY, MISSOURI
E-12	---	24" C I.	KANSAS CITY, MISSOURI
E-13	---	24" C I.	KANSAS CITY, MISSOURI
	ROCK CREEK SEWER OUTFALL	2'x2' R C	INDEPENDENCE, MISSOURI
	SUGAR CREEK (INDEPENDENCE) SEWER	21" C I	INDEPENDENCE, MISSOURI
	SUGAR CREEK (SUGAR CREEK) SEWER	10" C I.	SUGAR CREEK, MISSOURI

FAIRFAX-JERSEY CREEK UNIT

NUMBER	NAME	SIZE	OWNER
F-1	PUMPING PLANT F-9	54" S P.	FAIRFAX DRAINAGE DISTRICT
F-2	PUMPING PLANT F-6	54" S P	FAIRFAX DRAINAGE DISTRICT
F-3	PUMPING PLANT F-7	54" S P.	FAIRFAX DRAINAGE DISTRICT
F-3a	G O P. WASTE OUTFALL	2" STEEL	GENERAL MOTORS CORPORATION
F-4	PUMPING PLANT F-2	42" S P	KANSAS CITY, KANSAS
F-5	3rd & MINNESOTA AVENUE SEWER	33" R C.	KANSAS CITY, KANSAS
F-5a	---	-	---
F-5b	---		---
F-6	FEDERAL COLD STORAGE DRAIN	10" C I	MINNESOTA AVENUE, INC
F-7	JERSEY CREEK SEWER OUTFALL	10½'x17½'R C	FAIRFAX DRAINAGE DISTRICT
F-8	JERSEY CREEK P.P. OUTLET	11'x12' R C 2-36" S P	FAIRFAX DRAINAGE DISTRICT
F-9	---	8" S P	PHILLIPS PETROLEUM COMPANY
F-10	---	20" S P	PHILLIPS PETROLEUM COMPANY
F-11	---	20" S P	PHILLIPS PETROLEUM COMPANY
F-12	PUMPING PLANT F-8	20" S P.	FAIRFAX DRAINAGE DISTRICT
F-13	FAIRFAX AIRPORT SYSTEM	66" C M	KANSAS CITY, KANSAS
F-14	PUMPING PLANT F-7	2-30") 1-6") S P.	KANSAS CITY, KANSAS
F-15	PUMPING PLANT F-5	30" S P	FAIRFAX DRAINAGE DISTRICT
F-16	PUMPING PLANT F-4	30" S P	FAIRFAX DRAINAGE DISTRICT
F-17	PUMPING PLANT F-1	3-60" S P.	FAIRFAX DRAINAGE DISTRICT
F-18	WATER & LIGHT PLANT OUTLET	42" C I	KANSAS CITY, KANSAS
F-19	" " " "	24" C I	KANSAS CITY, KANSAS
F-20	" " " "	6'x6' R C. BOX	KANSAS CITY, KANSAS
F-21	" " " "	6'x6' R C BOX	KANSAS CITY, KANSAS
F-22	" " " "	30" C.I.	KANSAS CITY, KANSAS
F-23	" " " "	42" C.I.	KANSAS CITY, KANSAS
F-24	" " " "	5" S P	KANSAS CITY, KANSAS
F-25	" " " "	24" C I	KANSAS CITY, KANSAS
F-26	" " " "	48" C I.	KANSAS CITY, KANSAS
F-27	" " " "	6" C.I.	KANSAS CITY, KANSAS
F-28	" " " "	30" S P	KANSAS CITY, KANSAS
F-29	" " " "	12" C.I. SLEEVE	KANSAS CITY, KANSAS
F-30	" " " "	30" S P	KANSAS CITY, KANSAS
F-31	" " " "	48" C M. & 36" S P LINER	KANSAS CITY, KANSAS
F-32	---	48" R C	---
F-33	---	24" C I	FAIRFAX DRAINAGE DISTRICT

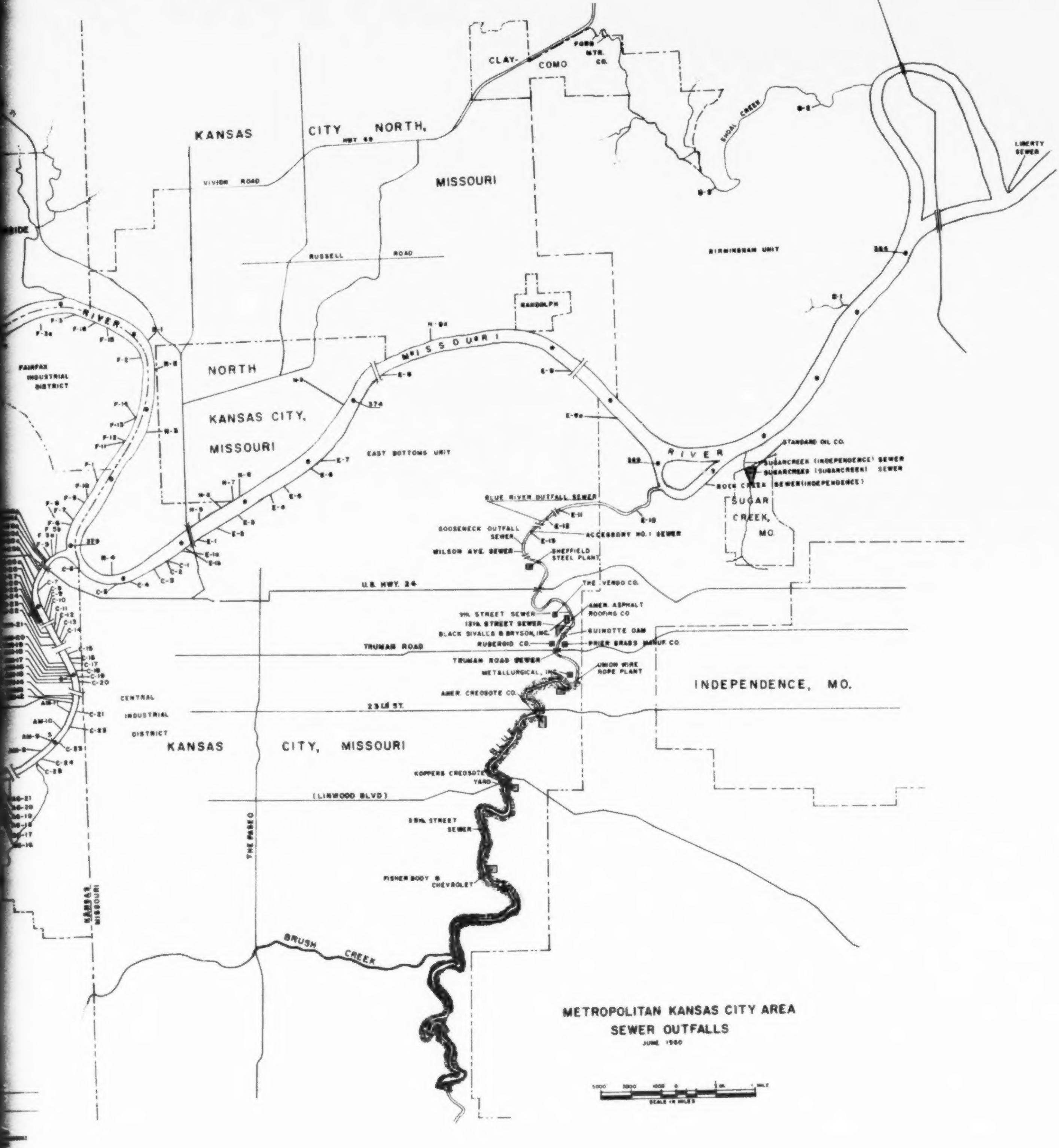


SEWER OUTFALLS

NORTH KANSAS CITY UNIT

NUMBER	NAME	SIZE	OWNER
N-1		36" R C	KANSAS CITY, MISSOURI
N-2	26th AVENUE P.P. OUTFALL	72" R C	NORTH KANSAS CITY, MISSOURI
N-3	MUNICIPAL AIRPORT P.P. #2 OUTFALL	36" C I	KANSAS CITY, MISSOURI
N-4	MUNICIPAL AIRPORT P.P. #1 OUTFALL	6'x6' R C BOX	KANSAS CITY, MISSOURI
N-5	BURLINGTON AVENUE P.P. OUTFALL	84" R C	NORTH KANSAS CITY, MISSOURI
N-6	CORN PRODUCTS REFINING CO. P.P. OUTFALL	24" C I	CORN PRODUCTS, INC
N-7	HOWELL STREET P.P. OUTFALL	72" R C	NORTH KANSAS CITY, MISSOURI
N-8	LINDE AIR PRODUCTS SEWER	3" S P.	LINDE AIR PRODUCTS CO.
N-9	ROCK CREEK P.P. OUTFALL	Dbl 6'x6' R C BOX	NORTH KANSAS CITY, MISSOURI
N-9a	BUCKEYE CREEK SEWER OUTFALL		KANSAS CITY, MISSOURI
	FORD MOTOR CO. PLANT OUTFALL		FORD MOTOR COMPANY
	LIBERTY SEWER OUTFALL		LIBERTY, MISSOURI

A



METROPOLITAN KANSAS CITY AREA
SEWER OUTFALLS
JUNE 1960

B

A. How it arose, you say?

MR. POWERS: Yes.

A. No, sir. An outfall is a point of discharge. It doesn't show the outfall line.

MR. STEIN: As I understand it, sir, this just shows the points of the outfalls where the waste goes from the outfalls at the terminal point into a stream or river.

MR. SAMSON: Excuse me, Mr. Clare, you say C-21 is the outfall for the Turkey Creek Sewer that this gentleman was inquiring about?

A. That is correct. You can follow, if I may, the location or the description of the outfalls in the tabulation at the left. Look under Central Industrial Unit, C-21, Turkey Creek-O.K. Creek Sewer outfall, a double 17 by 18 foot reinforced concrete box, owner Kansas City, Missouri.

CHAIRMAN WILSON: Do I hear any objection?

MR. KOENIGSDORF: Subject to our prime objection made this morning. I see many things on here that I think are irrelevant, Blue River, and so forth. But for the purpose of just showing what is on the map, we have no objection.

CHAIRMAN WILSON: It will be received with that understanding and with the understanding expressed as to previous exhibits, that counsel for any party may have a right to examine or cross-examine witnesses with reference to it and make further specific objections if desired.

With that understanding, it will be received.

(Government's Exhibit No. 14 received in evidence.)

Q. (By Mr. Stein) Did you prepare a summary of your investigations and evaluations of this area, Mr. Clare?

A. I did.

Q. Do you have that reduced to writing?

A. I do.

MR. STEIN: If the Chair please, at this point we would like to distribute copies of this summary. I believe it will aid in the following of Mr. Clare's description. At this point we would not want to identify this as an exhibit, but at the conclusion of Mr. Clare's testimony we may wish to put this in as an exhibit. At this point--

CHAIRMAN WILSON: Just a moment.

MR. STEIN: Yes.

CHAIRMAN WILSON: In order to avoid confusion here, I suggest that everyone who has received a copy of Exhibit 14 mark it with that number. If any other exhibits are to be distributed, everyone had better keep track of them. So mark this map Exhibit 14. And you might indicate on there that C-21 is the Turkey Creek outlet.

Now, with reference to this further exhibit, it seems to me, Mr. Stein, that if you intend to offer it at any later time you had better have it marked with an exhibit number right now.

MR. STEIN: We would be very happy to offer this or mark this for purposes of identification as Exhibit No. 15. We will largely use this in order to save time because this exhibit may require considerable examination, but in the process of Mr. Clare's testimony I think counsel will have an opportunity to examine Exhibit 15.

CHAIRMAN WILSON: I think it would avoid confusion if you have it marked with a number now. You may do as you wish about offering it in whole or in part.

MR. STEIN: Yes.

CHAIRMAN WILSON: Just so we have something to refer to, as long as you are going to do something about it.

MR. STEIN: Yes.

(Government's Exhibit No. 15
marked for identification.)

CHAIRMAN WILSON: Exhibit 15. What do you call that?

MR. STEIN: We would call that a summary of municipal and industrial waste discharges of the Kansas Cities Metropolitan Area.

CHAIRMAN WILSON: Are you proposing to distribute copies of this to the Board?

MR. STEIN: Yes, they are being distributed to the Board now, sir.

CHAIRMAN WILSON: Then if you want it considered for that purpose, you had better at least lay a minimum foundation for its primary consideration at this time. The other parties may make any objections that they wish or reserve the right of further examination.

Q (By Mr. Stein) Were these summary tables prepared from your data?

A They were prepared from data that we got from the various sources, the consulting engineers and from our field work and--

Q Are these part of your official records?

SUMMARY TABLE
ESTIMATE OF MUNICIPAL & INDUSTRIAL WASTE DISCHARGES
METROPOLITAN KANSAS CITY

Individual or Group Sewer Outfall Designation	Outfall Number	Flow (mgd)	Sewered Population
FAIRFAX INDUSTRIAL DISTRICT(1)	F-1 - F-33	25.2	1,000
KCK contribution to Jersey Creek Outfall	-	5.07	40,000
Turkey Creek (Rosedale) at State Line*	-	0.72*	15,000*
Argentine Area (Right bank Kaw River)	AG-1 - AG-21	1.27	
Armourdale Area (Left bank Kaw River)	AM-1 - AM-28	16.94	
Central Industrial Dist.(Right bank Kaw)	C-6 - C-20	3.23	
Total - KANSAS CITY, KANSAS		26.51	125,000
*Not included in KCK totals			
Turkey-OK Creek Outfall, South Barrel	C-21	11.49	(118,200)
Turkey-OK Creek Outfall, North Barrel	C-21	5.99	( )
Santa Fe thru Truman Br. Sewers, Inclusive	C-1 - C-5 and E-1 - E-9	16.29	33,000
Blue River Sewer Outfalls		32.08	371,900
Kansas City North Sewer Outfalls	N-9 & N-4	0.72	10,000
Total - KANSAS CITY, MISSOURI		67.57	533,100
NORTH KANSAS CITY SEWER OUTFALLS	N-2,5,6,7, & 9	13.50	7,400
SUGAR CREEK, INDEPENDENCE & STANDARD OIL REFINERY OUTFALLS		15.96	46,300
TOTAL METROPOLITAN KANSAS CITY		126.06	712,800
(1) The Fairfax Drainage District, per se		21.7	-

72b

SUMMARY TABLE
MATE OF MUNICIPAL & INDUSTRIAL WASTE DISCHARGES
METROPOLITAN KANSAS CITY

	Flow (mgd)	Sewered Population	P.E. (BOD)	P.E. (SS)	Total Chloroform Extract (#/day)
-33	25.2	1,000	70,000	140,000	13,066
	5.07	40,000	54,300	46,900	
	0.72*	15,000*	8,250*	9,150*	
AG-21	1.27		41,000	15,700	
AM-28	16.94		406,100	404,300	
-20	3.23		78,300	116,400	
	26.51	125,000	579,700	583,300	33,841
	11.49	(118,200)	127,500	130,800	
	5.99	( )	78,500	69,100	
-5 and -9	16.29	33,000	190,200	170,300	
	32.08	371,900	340,600	323,300	
-4	0.72	10,000	10,000	10,000	
	67.57	533,100	746,800	703,500	79,971
,7, & 9	13.50	7,400	120,000	190,600	1,808
	15.96	46,300	61,800	59,300	9,775
	126.06	712,800	1,578,300	1,676,700	138,461
	21.7	-	55,100	130,700	

A. Yes.

Q. Do they substantially represent a synthesis of the information you got concerning the waste outfalls and loadings in the area, in the Kansas City area?

A. They do.

CHAIRMAN WILSON: Have you supplied the city counsel with copies? Or let them take a look at the original exhibit.

MR. SAMSON: Mr. Stein, you can have my copy if you are short.

MR. STEIN: Thank you, sir.

MR. SAMSON: Yes, sir.

CHAIRMAN WILSON: We can use one between us.

MR. SAMSON: All right.

Q. (By Mr. Stein) Mr. Clare, would you indicate to us, based on your observations, studies and investigations, the sewage outfalls in the various areas? And if you have need to refer to aerial photographs, call our attention to those as you go along.

CHAIRMAN WILSON: Well, I suggest, Mr. Stein, that you first have him describe the relationship between this Exhibit 15 and Exhibit 14, and then offer Exhibit 15 in evidence at this time for whatever purposes you now wish it to serve, so that counsel for any other parties may decide whether they want to let it go in without objection or interpose objection.

Q. (By Mr. Stein) Would you describe this in relation to Exhibit 15?

A. Exhibit 14 is a map of the Kansas Cities Metropolitan Area--

CHAIRMAN WILSON: We have already admitted that.

A. Yes, sir.

Q. (By Mr. Stein) 15?

A. And 15 is a tabulation of the size, ownership and information that we have available on flow and strength of wastes from each sewer outfall listed on Government Exhibit 14.

Q. Doesn't 15 contain a summary table of all the information?

A. It contains a summary table, yes. These are listed first by districts or by units and then this information is all summarized on a sheet near the back entitled "Summary Table, Estimate of Municipal and Industrial Waste Discharges, Metropolitan Kansas City."

CHAIRMAN WILSON: The numbers in the left-hand column of the first few pages refer to the corresponding number--that is, the first few pages of Exhibit 15 seem to list the physical characteristics of these outlet points and they refer to the outlet points having the corresponding numbers on Exhibit 14?

A. That is correct.

CHAIRMAN WILSON: And then there are also attached to Exhibit 15 some tables giving further information?

A. That is correct.

CHAIRMAN WILSON: As to waste discharges and other data relating to the same outlets?

A. That is correct.

CHAIRMAN WILSON: With that understanding, have counsel for any interested parties any objections to the reception of this Exhibit 15?

MR. MURPHY: Are copies of Exhibit 15 available, Mr. Chairman?

CHAIRMAN WILSON: Are there any more copies available? Well, let all the counsel who wish to look at them look either at the original exhibit or a copy. You may take these copies that we have here for that purpose if you wish. Any counsel wishing to examine this exhibit, please do so.

In order to save time here, may I suggest that we receive this exhibit under the same conditions as previously stated with reference to exhibits which counsel had not had an opportunity to examine, that is that it will be subject to further examination of this witness or any other witness or cross-examination of this witness or any other witness by a counsel for any interested party and to any further specific objections that counsel for any party may wish to interpose.

MR. KOENIGSDORF: May I ask a qualifying question, please?

CHAIRMAN WILSON: Would you like to examine this witness:

MR. KOENIGSDORF: I would like to ask one qualifying question, if I might, please.

CHAIRMAN WILSON: Go ahead.

MR. KOENIGSDORF: Mr. Clare, I note on the bottom of the sixth page on Turkey Creek Diversion Tunnel Outlet, you note ownership in Kansas City, Missouri. I would like to ask you, sir, how you arrived at the term ownership or what that means as far as this report is concerned?

A. Well, it is my understanding that the Diversion Tunnel was built by Kansas City, Missouri, and is maintained by Kansas City, Missouri.

MR. KOENIGSDORF: Do you know of any contract with another governmental agency regarding that particular outlet?

A. No, I have seen no contract on it.

MR. KOENIGSDORF: I believe there is a question involved there.

A. I see.

MR. KOENIGSDORF: And I wanted to know if you particularly had made an investigation to determine that that belonged to Kansas City, Missouri?

A. No.

MR. KOENIGSDORF: Or if that was just a conjecture on your part?

A. Well, it is my understanding that it was built by Kansas City, Missouri, and is maintained by them and we list those as owners. Now, they may not be the legal owners. I am sorry, I can't answer that.

MR. POWERS: Well, the city objects to the conclusion found on this chart that Kansas City, Missouri, is the owner, because that whole subject was the matter of a contract years ago between the Kaw Valley Drainage District--

MR. SAMSON: Where is that?

MR. KOENIGSDORF: It is on the sixth page.

MR. POWERS: It states a conclusion as to who is the owner of this Turkey Creek-O.K. Sewer outfall and the Turkey Creek Diversion Tunnel Outlet.

CHAIRMAN WILSON: Are there any others who wish to examine the witness at this time with reference to this exhibit?

Than this exhibit will be received, subject to the conditions that I previously stated and to further examination by any parties with reference to any of its contents.

(Government's Exhibit No. 15
received in evidence.)

MR. KOENIGSDORF: Did you rule on our objection, Mr. Chairman, as to this exhibit showing ownership? We object to that conclusion drawn on this without further proof behind it.

CHAIRMAN WILSON: That objection will be noted and the exhibit was taken subject to that objection.

MR. KOENIGSDORF: Thank you.

Q. (By Mr. Stein) Mr. Clare, using Exhibits Nos. 13, 14 and 15, would you identify the particular sewer outlets and what you learned in your observations and studies about the material emanating from these outlets?

A. Referring to Government Exhibit No. 14, north of Kansas City, Kansas, in the bend of the Missouri River you will notice the Fairfax Industrial District. For the purpose of this description, and following the tabulation in the first part of Government Exhibit No. 15, you will find a reference to the Fairfax-Jersey Creek unit. Now, for the purpose of this discussion I should like to include in the Fairfax-Jersey Creek unit the Fairfax Industrial District, which I understand is not within the city limits of Kansas City, Kansas, and the north portion of Kansas City, Kansas. This area is highly industrialized, it is served by a total of some 36 outlets, is listed on the table and also under the Fairfax-Jersey Creek unit part on Government Exhibit 14.

Approximately 14 of these 36 are outlets and intakes for the Kansas City, Kansas, municipal water and power plants located on the Missouri River north of Kansas City, Kansas.

Q. Do you have an aerial photograph covering this too, Mr. Clare?

A. Yes, I do.

Q. Is this part of your official records?

A. Yes.

Q. Where is that Aerial Photograph?

A. This one (indicating).

MR. STEIN: This aerial photograph is from a negative marked ZJ-1N-18. There is a certificate on this saying that it was prepared by the Secretary of Agriculture. And I ask that this be marked as Government Exhibit No. 16 for purposes of identification.

(Government's Exhibit No. 16
marked for identification.)

Q. (By Mr. Stein) Will you briefly tell what this aerial photograph covers?

CHAIRMAN WILSON: That is Exhibit 16?

MR. STEIN: Yes.

A. Across the lower part of the aerial photograph is the Quindaro bend of the Missouri River (indicating). The Fairfax Industrial District is off to the southeast, the top of the map being north. The municipal power and water plants of Kansas City, Kansas, are in the lower central part (indicating) of the photograph.

MR. STEIN: I offer this aerial photograph as Government Exhibit No. 16.

CHAIRMAN WILSON: Are you offering this?

MR. STEIN: I offer this as Government Exhibit No. 16 in evidence.

CHAIRMAN WILSON: Any objection?

Q. (By Mr. Stein) Will you proceed, Mr. Clare?

MR. SAMSON: Before Mr.--

SECRETARY AYERS: Has it been admitted?

MR. JOHNSON: Is it admitted?

CHAIRMAN WILSON: I am waiting for other counsel.

Hearing no objection, the exhibit will be received.

(Government's Exhibit No. 16
received in evidence.)

MR. SAMSON: I have just one question. On Exhibit 16, Mr. Clare--pardon me for interrupting at this stage of your testimony--is Turkey Creek shown there?

A. No, it isn't.

MR. SAMSON: Where is this photograph taken relative to Turkey Creek?

A. Turkey Creek is to the south and east some, oh, five or six miles.

MR. SAMSON: Very well. Thank you.

Q. (By Mr. Stein) Mr. Clare, it might be helpful to the Board if you could point on the large map the area covered by the photograph.

A. The area covered by the photograph is--

Q. And describe to what you point.

A. --north of Kansas City, Kansas (indicating), and the Fairfax Industrial area and Fairfax Airport (indicating). The bend that I mentioned as the Quindaro bend of the Missouri River is the portion immediately north of the Fairfax Industrial area and Fairfax Airport. So the photograph covers that bend of the Missouri River and a portion of the flood plain to the north of the river as well as some of the bluffs farther north. The bluffs are on the north part of the photograph, the flood plain is in the center, the Quindaro bend is across the southern part of this photograph and the water plant is at the south part or lower edge of the photograph.

Q. Would you proceed, Mr. Clare, with your description of the outfall? Would you describe those markings on there? Who prepared those markings, Mr. Clare?

A. These markings were placed on the map in my office under my supervision.

Q. What do those markings indicate?

A. They indicate the location of outfall and intake lines on the Missouri River.

Q. And all these markings are on Government Exhibit No. 16?

A. That is correct.

Q. Would you describe them, Mr. Clare?

A. F-33--the prefix "F" is used here to indicate the Fairfax unit--discharges domestic sewage from a small area to the south. F-32 is a storm drain which carries water from back of the levee dike at the lower end--or the upper end of this area (indicating) into the municipal power plant area into the Missouri River. The large mark here (indicating) indicates some 13 outlets and intakes along the river front serving the Kansas City, Kansas, water plant and the Kansas City, Kansas power plant.

F-17 is a storm drain carrying surface water from back of the dike or back of the levee into the Kansas River--or Missouri River. I am sorry.

F-4 is also a storm drain.

Q. Will you proceed down river with the next portion?

A. I have to have another map.

MR. SAMSON: Mr. Clare, those points that you just referred to, are they in Missouri or in Kansas?

A. They are in Kansas, discharging into the Missouri River in Kansas.

Q. (By Mr. Stein) What jurisdiction are they in Kansas?

A. Well, the storm drains we have owned by the Fairfax Drainage District.

Q. Mr. Clare, I call your attention to an aerial photograph marked ZJ-1N-10, with a seal affixed by the Department of Agriculture, signed by the Secretary and the Assistant General Counsel, purporting to be an aerial photograph of part of the Kansas Cities Metropolitan Area.

MR. STEIN: I ask that this be labeled for purposes of identification as Government Exhibit No. 17.

(Government's Exhibit No. 17
marked for identification.)

Q. (By Mr. Stein) I wonder if you can describe this generally and relate it to its position on the map represented by Government Exhibit No. 13.

A. The area shown on Government Exhibit No. 17 is the Fairfax Industrial area, including the Fairfax Airport. The bend of the Missouri River, with Missouri on the right, Kansas on the left, facing this photograph, is known as the Kaw Bend (indicating). Do you want me to describe each of these points?

Q. No. Mr. Clare, were the markings on this aerial photograph, and subsequent aerial photographs which you might consider, prepared under your supervision and direction?

A. Yes.

Q. And do they relate to sewage outfalls on the river?

A. And storm outfalls, that is right.

Q. And storm outfalls?

A. Yes.

Q. You may wish to group them or classify them going downstream and cover them as rapidly as possible.

CHAIRMAN WILSON: Do you offer that in evidence?

MR. STEIN: We are offering this aerial photograph in evidence as as Government Exhibit No. 17.

CHAIRMAN WILSON: Any objection?

Hearing none, it will be received.

(Government's Exhibit No. 17
received in evidence.)

A. F-3a shown on the aerial photograph Government Exhibit No. 17 is a small steel line discharging wastes from the Buick-Oldsmobile-Pontiac plant on the river side of the levee. The white waste deposited can be seen in the photograph (indicating).

F-3, 16, 15, 2 are storm drains carrying surface water from back of the levee.

F-13 is a waste outlet for the Fairfax Airport sewage system. Our records indicate it is owned by Kansas City, Kansas.

F-9, 11 and 10 are waste outlets from the Phillips Petroleum Company plant.

F-9 and 11 carry refinery wastes.

I was never able to locate F-10. It is recorded by the Corps of Engineers to be a drain from a storage tank area in the Phillips Refinery yard.

F-7 is the outlet for a major portion of the domestic and industrial wastes for the remainder of the Fairfax Industrial area and for a part of Kansas City, Kansas, the northern part. This outlet is frequently referred to as the Jersey Creek Sewer Outfall.

MR. KOENIGSDORF: What was that name?

A. Jersey Creek.

MR. KOENIGSDORF: Jersey?

A. Yes. The plant and outfall line, according to our records, are owned and operated by the Fairfax Drainage District.

I believe that covers the outlets on this section. I think that now we can use this map (indicating) for the next group.

Q. (By Mr. Stein) Mr. Clare, I call your attention to an aerial photograph consisting of two aerial photographs bolted together, from negatives ZJ-1N-8 and ZJ-1N-6, which appears on the bottom, both of them attested to be part of the Kansas Cities Metropolitan Area by the Secretary of Agriculture of the United States and the Assistant General Counsel of the Department of Agriculture.

MR. STEIN: I ask that these exhibits be marked as Government Exhibit No. 18 for purposes of identification, the top one to be labeled 18-A, the bottom 18-B, both to be considered jointly as bolted together here as one government exhibit, 18.

(Government's Exhibit No. 18,
including 18-A and 18-B,
marked for identification.)

Q. (By Mr. Stein) Mr. Clare, will you briefly describe these photographs and relate it to its position on the map represented by Government Exhibit 13?

CHAIRMAN WILSON: Just a moment. Any objection to receiving these exhibits, Exhibits 18-A and 18-B?

MR. SALOME: Mr. Chairman, is it in order for me to ask a question at this time?

CHAIRMAN WILSON: Certainly.

MR. SALOME: I am a bit curious as to why it is necessary to go up and down that stream to detail the various industries, Phillips Petroleum, et cetera. I notice here that Fairfax and Kansas City, Kansas, have started on a procedure of correcting it. Now, if they are doing that, are they still a party to this situation today? In other words, they are complying with the schedule and here you are picking up Fairfax, you are picking up Kansas City, Kansas. Are they still in this picture or is their schedule going to be disrupted or something like that?

MR. STEIN: We are not suggesting that. The Secretary did name these parties you name as parties to this hearing and we are just proceeding to give a complete factual picture for the Board to show just what is in this area.

MR. SALOME: Well, I can see that. But I wonder why you consume a lot of time on Fairfax when it says they are complying and on Kansas City, Kansas, when it says they are complying and moving along on this thing. That is all I am concerned about, the time we are consuming on it. But if it is necessary--

MR. STEIN: We appreciate that, sir, and we will try to cover these areas as rapidly as possible. I think what we are getting into here possibly is one of the key areas in the presentation and once we are through with this--

MR. SALOME: It is admitted that Fairfax and Kansas City, Kansas, are operating on schedule, is that correct?

MR. STEIN: Sir, I don't think it is our province to admit that or not. This is to be determined by the Board. I would certainly not say that they were not operating on schedule as approved by the Kansas authorities.

MR. SALOME: Perhaps I am asking the wrong man. Perhaps I should ask the witness.

Can you tell me whether they are?

A. No, sir, I can't tell you any more--

CHAIRMAN WILSON: Just a moment. Before we pursue this line of discussion any further, I think we had better rule on this exhibit. Obviously this exhibit is part of the general physical picture which the government is presenting for the consideration of the Board and at least it is desirable to have it in for that purpose. And hearing no objection, Exhibits 18-A and 18-B will be received in evidence.

(Government's Exhibit No. 18,
including 18-A and 18-B,
received in evidence.)

CHAIRMAN WILSON: Now, with reference to the government's position on any industries on the Kansas side of the river who claim that they are not in default in any recommended schedule, either by their state authorities or the government, I am assuming that the government will not waste any time in going into detailed evidence with those agencies any more than is absolutely necessary to lay the foundation for your main case that you have to make here.

MR. STEIN: That is correct, sir. However, I would like to call attention that there was a schedule established by the conferees and I don't believe that schedule has been met by any of those parties.

CHAIRMAN WILSON: At any rate, these Kansas agencies are all represented by counsel--

MR. STEIN: Yes.

CHAIRMAN WILSON: --or by their other representatives here, so that when their turn comes they will be in a position to make whatever presentation they wish.

MR. STEIN: That is right.

CHAIRMAN WILSON: And the government can either accept that or offer evidence about it as you feel necessary.

Q. (By Mr. Stein) Mr. Clare, I wonder if you could proceed and classify these in groups as much as possible in order to save time.

A. The aerial photographs in Government Exhibit 18-A and -B may be located on Government Exhibit 13 as being the confluence of the Kansas and Missouri Rivers, a short stretch of the Missouri River below that confluence, and a short stretch above the confluence. In other words, it is a part of Kansas City, Kansas, and a part of Kansas City, Missouri; Kansas lying to the left of the Missouri River to the point of confluence with the Kansas River and then to the left of the Kansas River on this photograph.

Q. Mr. Clare, will you identify the blue and red lines on that chart?

A. The blue line is the state line.

Q. Which side--

A. Kansas on the left and Missouri on the right.

Q. What is the red line?

A. The red line is the Turkey-O.K. Creek trunk sewer.

Q. Would you trace Turkey Creek Sewer? Does your red line start where, in Kansas on the Turkey Creek Sewer?

A. It starts in Kansas at the arrow (indicating). This is not the end of the line, but for the purpose of this illustration it is picked up at this point. And the Turkey Creek Sewer crosses the state line on Southwest Boulevard and follows the channel of Turkey Creek around the point of the hill back across the state line and into Kansas and into the Kansas River at point C-21.

Q. Now, what are the other two red lines doing at the Turkey Creek and O.K. Creek Sewers?

A. To the right at the center of the photograph is the O.K. Creek Sewer, which follows the water course of O.K. Creek before it was developed by the railroad system and the Union Station, is now covered, is not an open channel, and it flows into the Turkey Creek Sewer just west--pardon me--east of the state line about, I would say, a half mile above the confluence of the Turkey-O.K. Creek Sewer with the Kansas River. The other red line just to the north of the one I described is the O.K. storm sewer which drains the Union Station area and part of the railroad yards and flows into the O.K. Creek Sewer.

Q. Do both the Turkey and O.K. Creek Sewers in Kansas City, Missouri, carry storm water as well as other wastes?

A. They do.

Q. But for the construction of these sewers, would the Turkey Creek and its tributary, O.K. Creek, have carried the runoff waters from this area?

A. They would.

Q. In other words, the Turkey Creek Sewer crosses the border from Kansas into Missouri, then back again into Kansas?

A. That is correct.

Q. Now, I would like to call your attention to the blue line in the uppermost part of your map where it gets into the Missouri River just outside where the Kansas River joins with the Missouri. Is this the division of state line between Kansas and Missouri here?

A. Yes.

Q. In other words, the river is the boundary between the two states at that point?

A. The Missouri River is the boundary between Kansas and Missouri until it reaches the confluence of the Kansas River.

Q. It forms a part of the boundary?

A. That is right.

Q. Would you proceed in general terms now describing the outfalls here?

A. For the purpose of this presentation I have prepared it to give first a summary of the Armourdale outfalls shown on Exhibit No. 14 with the prefix "AM". These are in Kansas. They are to the west and north of the Kansas River in what is indicated on this exhibit as the Armourdale Industrial District and part of Kansas City, Kansas. This unit is served by some 40 outlets. Of these, AM-30--I don't have them. I am sorry, I don't have AM-30 on the map. It is on another map.

May I summarize it in this way? Approximately seven outlets are storm and surface water drains discharging to the Kansas River. These are listed on Exhibit 14 as AM-23, 28b, 28c, 28e, 28f, 28g, and 29. Industrial wastes and municipal sewage outlets number twelve. Some of these are off this map also.

Q. Can we just have a listing of those?

A. Yes. They are AM-1, 2, 3, 5, 6, 7, 11, 26, 27, 28, 28a and 28b. AM-1 and 2 are industrial waste outlets serving a soap plant, Procter and Gamble. This is at the intersection of Kansas Avenue with the Kansas River. These are the uppermost outlets shown on Exhibit 14 on the north side of the Kansas River.

AM-3 is a municipal outlet serving a soap plant and a commercial and industrial as well as residential area in Kansas City, Kansas.

AM-4 serves the National Cylinder Gas Company.

AM-6 and 7 serve commercial, industrial and residential areas.

AM-8 serves the Midwest Cold Storage Plant.

AM-9 and 10 are sewers formerly used by Wilson and Company. This plant, however, is shut down and the buildings are presently used by the Kaw Warehouse and Storage Company.

AM-11 serves a meat packing plant and a commercial area.

AM-12, 13, 14, and 15 are outlets formerly used by Cudahy Packing Company and these buildings are now used by Glazer Kaufman Company as warehouses.

AM-16, 17, 20 and 21 are Kansas City Stockyards sewer outfalls. These outlets carry stockyard drainage.

AM-18 and 19 serve Swift and Company Packing Plant and stock pens.

AM-23 and 24 formerly served the Morris Packing Company plant and AM-23 now serves a liquid chemical packaging operation.

AM-25 serves a meat packing operation, the Central Packing Company.

AM-26 and 27 serve part of the Riverside sewer district.

AM-28 serves a commercial and residential area.

The next--

Q. Mr. Clare, I wonder if we could summarize these by districts, because I think the details do show up on your exhibits.

A. All right. With reference to the summary table in Exhibit No. 15, the first item is a summary describing waste discharges from the Fairfax Industrial Unit. For outfalls F-1 through 33 the flow has been estimated at 25.2 mgd.

Q. What does mgd mean?

A. Million gallons per day. The sewered population is estimated at 1,000.

MR. SAMSON: Mr. Clare, which page are you on?

A. I am on the summary table on Exhibit 15.

MR. SAMSON: Thank you, Mr. Clare.

A. The BOD population equivalent is estimated at 70,000 and the suspended solids population equivalent at 140,000. The total chloroform extracts as determined from samples submitted to Washington University for analysis indicates that the total pounds per day discharged from this district are 13,066. Note the footnote, that the consulting engineers for the Fairfax Drainage District, per se, estimate that the flow from that district is 21.7 million gallons a day, the BOD P.E. is 55,100, and the suspended solids P.E. 130,700.

Q. (By Mr. Stein) Mr. Clare, would you--

MR. KOENIGSDORF: What page is that on?

MR. SAMSON: The very last page.

Q. (By Mr. Stein) Will you explain what BOD is, very briefly, population equivalent? Are these indicators of pollution?

A. They are. The BOD is an abbreviation for the biochemical oxygen demand. It is a measure of the organic materials in wastes that have a demand or an affinity for oxygen. The population equivalent means that these wastes have a strength in materials of this type which would be equivalent to the wastes from strictly domestic sewage from, in this case, 70,000 people. In other words, they are equivalent, the wastes are equivalent, to the wastes from 70,000 people.

CHAIRMAN WILSON: Just a minute, Mr. Clare. I assume that probably most people here understand what you mean by this biochemical oxygen demand, but you might explain in just what terms that is stated. It is stated in terms of a certain quantity of oxygen, is it not, that is required to neutralize a certain amount of pollutional materials?

A. That is correct.

CHAIRMAN WILSON: Can you explain briefly just what that is? There is a time factor in there also, is there not?

A. Yes, these are five-day BOD's. In other words, the waste sample is mixed with a dilution water which has a measured amount of oxygen in it and is incubated at 20-degrees centigrade for five days and the amount of oxygen remaining in the sample is measured and the difference between the amount of oxygen remaining and the amount in the sample originally is a measure of the oxygen demand of that particular sample.

CHAIRMAN WILSON: And the higher the demand the greater the pollution?

A. That is correct, sir, the stronger the waste.

Q. (By Mr. Stein) What other districts are covered by that map, Mr. Clare?

A. By Exhibit 18?

Q. Yes

A. The Armourdale District, as I indicated, is shown on the left.

Q. Yes.

A. And the Central Industrial District is shown on the right. There is also a small part of the Argentine Industrial District.

I might locate these districts on Exhibit 13 and perhaps you can follow them on Exhibit 14. The Argentine Industrial District is south of the Kansas River in Kansas City, Kansas. The Central Industrial District is to the west of the Kansas River and south of the Missouri River in Kansas and Missouri.

Q. Mr. Clare, would you indicate in summary form what comes from these districts?

A. From the Armourdale District, which we have just described west of the Kansas River, the flow is estimated at 16.94 million gallons per day, the BOD population equivalent at 406,000 and the suspended solids population equivalent at 404,000. This is on the second page describing the Armourdale unit in Government Exhibit 15.

Q. What other units have you described there?

A. Another unit is the Argentine Industrial District and--

Q. Does the Argentine Industrial District appear where you pointed on the lower left-hand corner of the map of Exhibit 18?

A. Yes. It actually extends from that portion of Exhibit 18 westward. Part of the Argentine Industrial District is not shown on Government Exhibit 18. It is shown, however, on Government Exhibit 14.

Q. How about the Turkey Creek Sewer? Is that shown on your map?

A. It is.

Q. What emanates from that source?

A. The Turkey Creek Sewer is in the Central Industrial District. Do you want me to outline the entire Central Industrial District--

Q. No. Would you indicate where the Central Industrial District is?

A. The Central Industrial District is--

Q. You are pointing to Government Exhibit No. 18?

A. That is correct. --on both sides of the state line, on the west side of the state line in Kansas, north to the Missouri River, and on the east side of the state line in Missouri north to the Missouri River.

Q. Is that north or south?

A. North toward the Missouri River.

Q. How many sewer outfalls are there in this Central Industrial District?

A. There are some 25 sewer outfalls in the district.

Q. Does this district encompass both Kansas City, Missouri, and Kansas City, Kansas?

A. It encompasses parts of both, yes, sir.

Q. Does it carry wastes from both the municipal sewer system and industrial?

A. It does.

Q. Would you care to indicate what the flow from this district is?

MR. SAMSON: What district are you referring to specifically, Mr. Stein?

MR. STEIN: Central Industrial District, including the Turkey Creek Sewer.

MR. JOHNSON: That is the Turkey Creek-O.K. Creek?

MR. STEIN: Yes.

A. Well, I have this broken down by the Central Industrial District without the Turkey Creek Sewer and then I will give you the figure--

Q. (By Mr. Stein) Okay.

A. --with the Turkey Creek Sewer.

Q. What is it without the Turkey Creek Sewer?

A. The outlets without the Turkey Creek Sewer discharge an estimated 3.23 million gallons per day.

MR. SAMSON: Not so fast, there, now, Mr. Clare.

A. 3.23 million gallons a day, with a BOD population equivalent of 78,300, and a suspended solids population equivalent of 116,400.

Q. (By Mr. Stein) How about the Turkey Creek and O.K. Creek Sewer system?

A. The Public Health Service made a special study of this sewer system and found that the dry weather flow averages 17.5 million gallons a day, it has a sewered population of 118,200, a BOD population equivalent--

MR. KOENIGSDORF: I can't keep up.

MR. SAMSON: You are too fast there.

A. Too fast? I am sorry.

MR. SAMSON: What is the sewered population, Mr. Clare?

A. You will find it under Item C-21 in the metropolitan Kansas City area tabulation, Turkey Creek-O.K. Creek outfall, sewered population 118,250. I think I gave that 118,200, but it is tabulated here as 118,250. Average flow 17.48 million gallons a day, suspended solids population equivalent 199,900, the BOD population equivalent 206,000 even.

Q. (By Mr. Stein) Moving down to your other units, which is the next one?

A. The East Bottoms unit.

Q. Do you have a photograph of that?

A. Yes, I do.

MR. POOLE: I have a question on this.

MR. STEIN: Yes.

MR. POOLE: If my notes are right, you said the Central District had, aside from the Turkey Creed-O.K. Sewer, a 3.23 mgd flow and then you gave some population equivalents of a round.number, 78,000 on a BOD and 116,000?

A. That is correct.

MR. POOLE: And then you say 17.48 flow for--

MR. SAMSON: Turkey Creek.

MR. POOLE: --Turkey Creek, but at the bottom of your sheet on Central Industrial units you have a total flow of 28.38. We lost about eight million gallons somewhere.

A. Yes, we did. Oh, the figure that I gave, the 3.23 million gallons a day, was for the Central Industrial District outlets 6 through 20. I did not include 1 to 5. The outlets 1 to 5 are in Missouri. The ones that I gave are discharged into the Kansas River and one discharges to the Missouri River in Kansas very near the state line.

MR. POOLE: I see.

CHAIRMAN WILSON: Well, then, Mr. Clare, you are not making any correction of the figures shown on your tables in Exhibit 15 covering outlets C-1 down to C-25? Those figures as shown here, are they still correct?

A. They are still correct. The only correction I made--

CHAIRMAN WILSON: The figures that you testified to to which Mr. Poole called your attention included some additional outlets--

A. That is correct.

CHAIRMAN WILSON: --as you have just explained them?

A. Yes, sir. Five outlets in Missouri.

Q. (By Mr. Stein) Mr. Clare, I call your attention to another serial photograph, DL-5T-169, attested to by the Secretary of the United States Department of Agriculture and the Assistant General Counsel of that department as being an aerial photograph purporting to be part of the Kansas Cities Metropolitan Area.

MR. STEIN: And I ask that this be identified as Government Exhibit No. 19 for purposes of identification.

(Government's Exhibit No. 19 marked for identification.)

Q. (By Mr. Stein) Would you briefly describe that photograph and relate it to Government Exhibit 13.

A. I might first indicate the location of this area by reference to Government Exhibit 13. It is the Kansas City, Missouri, water front along the Missouri River south of that river. The state line runs north and south through the Central Industrial District on the left edge of the photograph. To the right of that line is Kansas City Missouri's River water front.

C-5 is commonly referred to as the Santa Fe Sewer--

CHAIRMAN WILSON: Just a minute. Are you offering that in evidence?

MR. STEIN: Yes. We would like to offer this in evidence as Government Exhibit No. 19.

CHAIRMAN WILSON: Any objection?
Hearing none, it will be received.

(Government's Exhibit No. 19 received in evidence.)

A. C-5 is commonly referred to as the Santa Fe Sewer. It is part of the Kansas City, Missouri, municipal system discharging to the Missouri River. It carries packing plant and stockyard wastes.

C-4 is commonly known as the Hay Press Sewer. It serves the American Wiper and Wastes Company plant immediately to the south.

C-3 is the Broadway Sewer. It serves a combined system. It enters the Missouri River at the foot of Broadway. It serves a commercial and industrial area.

C-1 and 2 is the Delaware Sewer outfall. It serves a combined sewer system and the tributary area is classified as light industrial and commercial area.

Q. (By Mr. Stein) Maybe we can cover the summaries and strengths all together at the end.

A. Yes, sir.

Q. Do you have any other districts you want to cover, Mr. Clare?

A. Yes. A portion of the East Bottoms area is shown on this photograph. It extends along the Missouri River to the east and actually includes the flood plain of the Missouri River from the Kansas City water front or the Kansas City reach of the Missouri River to the mouth of the Blue River and actually also includes part of the lower Blue River. This area is shown on Government Exhibit No. 14 and the outfalls in this unit have the prefix "E" for East Bottoms.

E-1a, as shown on Government Exhibit 14, is the cooling water inlet and outlet structure for the Grand Avenue Station of the Kansas City Power and Light Company. Sanitary sewage from this plant discharges to the Missouri River from E-1b.

E-1b is a municipal sewer outfall known as the Main Street Sewer. E-1 is the Holmes Street Sewer; E-2 Gillis Street; E-3 Lydia Avenue; and E-6 the Prospect Avenue Sewer. All these, E-1b through E-6, serve industrial and commercial as well as limited residential areas. E-6 at times carries considerably oily wastes.

E-4 is the sanitary sewage outlet for the Northeast Power Plant Station of the Kansas City Power and Light Company.

E-5 is an outfall which serves the Schenley Distilleries, Inc., plant. This plant is no longer in operation as a manufacturing establishment. Wastes from this line are, therefore, very limited.

E-7 serves the East Bottoms pumping plant of the Kansas City, Missouri Water Department.

E-8, the Milwaukee Bridge Sewer outfall, sometimes referred to as the Chouteau Bridge outfall, is essentially a storm outlet. However, it does serve a small industrial area and carries considerable oily wastes.

The point E-8a locates intake and outlet lines serving the Hawthorn Power Plant of the Kansas City Power and Light Company. Sanitary sewage from this plant also reaches the river at this point.

Wastes discharged to the Missouri River from outlets in this unit are estimated as follows:

Flow, 16.3 mgd; sewered population 33,000; BOD population equivalent 190,200; suspended solids population equivalent 323,300.

The remainder of the East Bottoms unit--

MR. RIDGE: Was that 323, the last figure?

A. 323,300. This is not all of the East Bottoms unit. These are the wastes discharged to the Missouri River. A part of the East Bottoms unit is in the Blue River Valley. The Blue River Valley, as indicated on Government Exhibit 13, is the valley extending northward from the bottom lower right of the map to the Missouri River, reaching the Missouri near Sugar Creek and Independence. This is considered in this presentation as part of the East Bottoms unit.

Q. (By Mr. Stein) Are there any other districts in what you consider the Kansas Cities Metropolitan Area which we haven't covered yet?

A. There is. Besides the East Bottoms unit--

Q. Yes.

A. --there is the North Kansas City's unit.

Q. Can you briefly show us on Government Exhibit No. 13 where the North Kansas City's unit is?

A. North Kansas City's unit includes North Kansas City, Missouri, Kansas City North, Missouri, and the area along the river in what is known as the Birmingham area.

CHAIRMAN WILSON: Mr. Stein, I think before the witness goes any further with the testimony of that unit we will take our afternoon recess, and this time for fifteen minutes. Be back promptly after fifteen minutes.

(RECESS)

CHAIRMAN WILSON: The hearing will come to order.
You may proceed, Mr. Stein.

Q. (By Mr. Stein) Will you proceed to the next grouping in the Kansas Cities Metropolitan Area? Which one is that, Mr. Clare?

A. The next grouping is the Blue River.

Q. Could you summarize for us the kind of material going into the Blue River?

A. I will. The Blue River Valley is highly industrialized. There is considerable domestic waste discharged to the Blue River through municipal sewer outlets and many of the industries located along the Blue River have their own outfalls into the river. A summary of the total wastes discharged to the Blue River as listed in the summary table, Government Exhibit 15, the flow 32.08 million gallons a day, the sewered population 371,900, the BOD P.E. is 340,600, and the suspended solids P.E. is 323,300.

Q. What other major units are there in the Kansas Cities Metropolitan Area?

A. There are two other major units, North Kansas City and the Sugar Creek, Independence and Standard Oil Refinery area.

Q. What kind of waste comes from the North Kansas City?

A. North Kansas City is highly industrialized.

Q. Is there municipal waste coming too?

A. There are municipal wastes, industrial and municipal wastes. There are five outfalls serving North Kansas City, Missouri. The flow as shown in the summary table, 13.50 million gallons a day, sewered population 7,400, the BOD population equivalent 120,000, the suspended solids population equivalent 190,600, the total chloroform extractables are calculated at 1,808 pounds per day.

The other unit in the Kansas City Metropolitan Area is the Sugar Creek, Independence and Standard Oil Refinery area. The summary table gives the flow as 15.96 million gallons a day, sewered population 46,300, the BOD population equivalent 61,800, the suspended solids population equivalent 59,300, the total chloroform extractables 9,775 pounds per day.

Q. Did you visit all these outfalls on one particular day?

A. No, I didn't.

Q. Can you give us the days you went out to observe these outfalls?

A. The first trip for observation of outfalls was by Corps of Engineers boat, a trip on the river, on August 18, 1959.

Q. You went on that trip?

A. I did. And I was also on the--

Q. What river was that?

A. That was the Missouri and the lower Kansas.

Q. All right. Go ahead.

A. I was also along the Missouri and Kansas Rivers observing outfalls on December 7, 1959, and December 8, 1959. Another reconnaissance I made on April 14 and April 15, 1960, another on April 28, 1960, a limited reconnaissance on May 2, 1960, another by boat on the Missouri River and to the Turner Bridge on the Kansas River on May 23, 1960, also on that date I made a trip up the Blue River, and the last reconnaissance was made on June 7, 1960.

Q. Based on your observations, studies and investigations did you compute the volume of strength of wastes discharged in the entire Kansas City area?

A. I did.

Q. In general how did you make this computation?

A. The elements of the figures for the wastes were taken from the consulting engineers' reports, from Public Health Service studies and in some cases from individuals and industries. The total flow for the total metropolitan area is estimated at 126.06 million gallons per day. This figure is shown on the summary table. The sewered population was estimated at 712,800, the BOD population equivalent at 1,578,300, the suspended solids population equivalent at 1,676,700, and the total chloroform extract 138,461 pounds per day.

Q. Now, I would like to call your attention to the Ford Plant. Are you familiar with the discharge there?

A. I haven't made an examination at the Ford Plant. However, I did--

Q. Do they have a treatment plant there?

A. They do. I contacted the Missouri Water Pollution Board.

Q. As far as you know, aside from this Ford Plant, are any of these other wastes you describe being treated?

A. Not as far as I know.

Q. Based on your knowledge of the field of waste disposal and sanitary engineering, how would you characterize these wastes? Are they municipal wastes?

A. Well, they are a mixture of municipal and industrial wastes.

Q. And what are your industrial wastes largely, organic wastes?

A. Largely organic wastes.

Q. Based on your knowledge of the field of waste disposal and sanitary engineering and your observations, are the wastes of the type found in the Kansas Cities Area amenable to known methods of treatment?

A. They are.

Q. In the course of your investigations and observations did you take any photographs of what you saw?

A. I did.

Q. Did you have these photographs developed?

A. I did.

Q. What form of development did they take?

A. They are colored 2 by 2 slides.

Q. Do you have these slides with you?

A. I do.

Q. Are these slides accurate representations of what you saw at the time of taking these photographs?

A. In my opinion they are.

Q. Including color and the objects they purport to represent?

A. Yes.

Q. May I have the slides?

MR. STEIN: I will ask to have these slides identified as Government's Exhibits 20 to 48 for the purpose of identification. And I wondered if we can have Mr. Clare cause them to be projected. May we set up the projection machine?

CHAIRMAN WILSON: Any objection?
Hearing none, it will be received and the exhibition will be permitted.

(Government's Exhibits Nos. 20 to 48, inclusive, marked for identification and received in evidence.)

A. This is Exhibit No. 20. It is a picture of the outfall F-13, the Fairfax Airport outfall. It discharges to the Missouri River in Kansas. It is a 66-inch diameter corrugated metal conduit. I took this picture on April 28, 1960. I also saw this outlet on May 23rd. On that occasion I observed it from a boat in the Missouri River.

Q. (By Mr. Stein) What material is coming out of there, Mr. Clare?

A. This outfall serves the Fairfax Municipal Airport and carries the wastes and also from the shops that they have there and the general drainage from the area. It is a combined sewer outlet. You can see some floating oil here (indicating) and some evidence of oil on the head wall as well as on the silt on the side of the outfall.

Q. May we have the next slide, 21?

A. This is a photograph of the Fairfax-Jersey outfall No. 11. It discharges to the Missouri River in Kansas. I took the picture on April 28, 1960. I observed the outfall from a boat on the Missouri River on May 23. It discharges part of the wastes from an oil refinery in the Fairfax Industrial District. Oil on the banks and on the vegetation and on the outfall structure indicates that it discharges considerable oily waste. The surface of the waste is also covered with a black oil.

MR. SAMSON: What outfall was that?

A. This is No. 11, F-11.

MR. SAMSON: Thank you.

Q. (By Mr. Stein) May we have 22?

A. This is a picture of the Fairfax-Jersey outfall F-10. It discharges to the Missouri River in Kansas. I took the picture on April 28, 1960. Other occasions on which I observed this outfall were August 19, 1959, May 2 and May 23, 1960. This outfall carries part of the liquid wastes from a petroleum refinery. The temperature of the waste, as you can note, is relatively high. There is a strong odor of petroleum products that reminded me of kerosene and fuel oil. Oil was also noticeable on the vegetation on the banks at the side of the outfall ditch. An oil film was also observed after these wastes were discharged to the Missouri River.

Q. May we have 23?

A. I think you might focus this a little better or am I standing too close? 23 is a picture of the Jersey Creek Sewer outfall, F-7, that discharges directly to the Missouri River in Kansas. I took this picture on August 19, 1958. I also observed the outfall on April 28, 1960, and May 2 and 23, 1960. The outfall carries a large amount of heavily polluted water, serves a large part of the Fairfax Industrial District and the north part of Kansas City, Kansas. The presence of domestic wastes in this outfall is indicated by the presence of feces, condoms, scraps of toilet paper and bars of soap. This obviously is a combined sewer. It is estimated that the average daily dry weather discharge from this outfall is about 22 million gallons per day.

Q. Mr. Clare, would you describe the operation of the gate? It resembles something like a guillotine.

A. The gate that Mr. Stein referred to is the black portion of the outfall structure, the upper part (indicating). The bar across here (indicating) is a brace, a structural member of the outfall walls. Actually it has nothing to do with the operation of the gate except it holds the walls in alignment. Of course this debris (indicating) was deposited on the members by high water.

Q. What is the purpose of the gate?

A. Oh, the gate is operated when the Missouri River is high and prevents flood waters from the Missouri, from the river side of the levee, from flowing back into the district 17 Kansas.

Q. Has this been experienced in the past in this area where high waters in the Kansas and Missouri Rivers have caused the sewers to back up and overflow?

A. It has happened. It has not occurred while I was in this area, but I understand that during the 1951 flood this did happen.

Q. But these gates are designed to prevent that?

A. To prevent that, that is correct.

Q. Thank you.

MR. KOENIGSDORF: Mr. Chairman, may we inquire at the same time, rather than go back over these pictures, if there is any cross-examination?

Is the Kansas River close to here?

A. The Missouri River flows from your right to left (indicating) and the Kansas River is about a mile--

MR. KOENIGSDORF: Downstream?

A. Downstream.

CHAIRMAN WILSON: I think that if any interested counsel want to ask questions by way of cross-examination, they may do so while the pictures are being shown in order to avoid going back.

MR. KOENIGSDORF: Thank you.

CHAIRMAN WILSON: But if any question occurs to counsel afterwards, we can have them shown again.

MR. SAMSON: Mr. Clare, is this on the Missouri side or on the Kansas side of the river?

A. This is on the Kansas side of the Missouri River.

MR. SAMSON: Thank you.

Q. (By Mr. Stein) May we have 25?

A. I believe the next is 24.

Q. 24.

A. This is a picture of the Armourdale Sewer outfall No. AM-28b. It discharges to the Kansas River just above its confluence with the Missouri. This discharges also in Kansas. I took this picture on May 23, 1960, and observed the outfall on August 19, 1959, and on May 2 and 23, 1960. On each of these occasions I observed considerable foam in the waste discharge. This is part of the Kansas City, Kansas, municipal sewer system. Can you move that a little bit? I think there is a fisherman off here. Yes (indicating).

Q. What is that man doing, fishing right below the sewage outfall?

A. It looks like he is getting ready to. I am sure he is, because we observed fishermen fishing below these outfalls on several occasions.

MR. ELSON: Would this be the indication or the suggestion, if not the conclusion, that the testimony that pollution is detrimental to fishing in other waters, of course, isn't necessarily true at all places?

A. I don't believe that would be indicated, not to me. I think you find that certain species of fish thrive in polluted water and this is especially true, I understand, of the carp. But I don't believe the sport fish thrive in water of this type.

MR. SAMSON: Is this outfall on the north or on the south side of the Kansas River?

A. Actually it is on the west side as it flows north approaching the Missouri River. It is on the Kansas--of course it is in Kansas but it is on the--

MR. W. N. SMITH: Is there any outlet valve or any block valve on that particular outlet?

A. Mr. Smith, this outfall is under a high bluff. There is no levee in this area. So I don't believe that there would be any flood control needed. It is possible that this foam is caused by, oh, maybe wastes from a laundry or something of that type falling through a steep outfall line or through drop manholes, so I don't believe that you need any flood blockage in this. I believe the consulting engineers can answer that more specifically when they are on the stand.

Q. (By Mr. Stein) May we have 25, please?

A. This is a picture of the Armourdale Sewer outfall No. 25. It also discharges in the Kansas River from the Armourdale side. I took this picture on May 23, 1960, observed the outfall on August 19, 1959, on May 2 and May 5 and May 23, 1960, and June 7, 1960. This outfall carries essentially meat packing plant wastes. The wastes discharged from this sewer outfall in the Kansas River frequently are colored red by blood in the packing house wastes. A red tinge can be noticed in the Kansas River in the foreground as well as in the discharge under the flap gate of the sewer outfall. This is recorded as a Riverside Sewer outfall. Note also the 10-inch outlet in the flood wall. This is an opening through which septic tank truck wastes are dumped. There is an arrangement back of the flood wall where these septic tank trucks can back up and discharge wastes through this opening into the Kansas River. This is Armourdale outlet No. 26. Beside this 10-inch opening there is a 2-inch pipe extending through the flood wall and this pipe serves as a drain for the pump house back of the flood wall. This is outlet No. AM-26. The consulting engineers have estimated that the wastes from the 24-inch outfall have an average daily flow of .76 mgd, million gallons a day, a BOD population equivalent estimated at 18,300, and suspended solids population equivalent estimate at 23,800.

Q. May we have slide 26, please?

A. This is the same outfall, Armourdale No. 25. I took this picture on June 7, 1960. These obviously are packing plant wastes also.

Q. I don't think I heard you. What is that red waste cascading down?

A. These are bloody wastes from a packing plant served by this 24-inch outfall that I referred to in Exhibit 25.

Q. May we have slide 27, please?

A. This is a picture of Armourdale outfall No. 18. This discharges to the Kansas River. I took this picture on June 7, 1960. I also observed this outfall on August 19, 1959, May 2 and May 23, 1960. This is waste from the larger of two Swift and Company outfalls. The brown material on the side is paunch manure and the black material (indicating) is dried congealed blood. The flow estimates on this outfall are 4.26 mgd, the BOD P. E. is 201,000, suspended solids P. E. 206,000.

Q. May we have slide 28, please?

A. This is a picture of Armourdale outfall No. 11 that discharges to the Kansas River. I took the picture on May 23, observed the outfall on August 19, 1959, May 2, 1960, and June 7, 1960. This outfall is also known as the Shawnee Avenue Pumping Plant outfall, is owned by Kansas City, Kansas. The outfall line carries wastes from a meat packing plant and from a commercial area. The red color at the outfall is caused by the presence of blood from the packing plant. Consulting engineers have estimated that the average daily flow from this outlet is .44 mgd. Wastes having a BOD population equivalent of 29,600 and suspended solids population equivalent of 42,100.

Q. May we have slide 29, please?

A. This is a picture of the 7th Street boat dock on the Kansas River. This is the 7th Street bridge (indicating) crossing the river. This, of course, is on the north side of the Kansas River in Kansas. I took this picture on May 23rd. I observed the dock on April 15, 1960. It is used by pleasure boats, especially on summer evenings and week ends. The 7th Street bridge on the metropolitan Kansas City area sewer outfall map, which is a government exhibit, is located between outfalls AM-7 and AM-8, so you can locate that bridge on the maps.

MR. SAMSON: Where is this picture taken with respect to the outfall on the preceding slide?

A. This is above the preceding slides. We are proceeding upriver, up Kansas River.

MR. SAMSON: Thank you.

Q. (By Mr. Stein) Mr. Clare, have you seen the people docked at this place--

A. Yes.

Q. --take their boats into the river?

A. Yes, I have.

Q. When they do, do they go down the river toward Missouri as well when they boat?

A. They go down the river as well as up. The Kansas River seems to be quieter and easier to navigate by pleasure boats then the turbulent Missouri.

Q. Thank you. May we have slide 30, please?

A. This is a picture of the Armourdale No. 3 outfall that discharges to the Kansas River; incidentally, above that dock. I took this picture on June 2. I also observed the outfall on April 14, 1960, and May 23, 1960. This is a Kansas City, Kansas, municipal sewer outlet, carries wastes from a soap plant and from commercial, industrial and

and residential areas. It is frequently referred to as the Osage Avenue Pumping Plant outfall. Consulting engineers have estimated that the average daily flow at this outfall is 2.6 mgd with a BOD population equivalent of 15,500 and suspended solids population equivalent of 39,100.

Q. May we have slide 31, please?

A. This is a picture of Armourdale No. 2 outfall ditch that discharges to the Kansas River near the Kansas Avenue bridge. I took this picture on June 7, observed the outfall on April 12 and April 15, 1960, May 2, May 23 and May 26, 1960. This outfall serves a soap plant in Kansas City, Kansas, and discharges to the Kansas River just below the Kansas Avenue bridge. The Kansas River is at the extreme top of the picture. I have observed a different colored waste discharged to this outfall at different times and this is indicated by the colored bands on the outfall ditch.

Q. What would you say that white material is in that outfall at this time, Mr. Clare?

A. That is foam.

Q. Foam?

A. Foam, yes.

Q. Have you any idea what kind of foam it is?

A. No, I don't, except that it serves a soap plant, so it must be detergents that are introduced.

Q. May we have 32, please?

A. This is a picture of Armourdale outfall No. 1 that discharges to the Kansas River near the Kansas Avenue bridge. I took this picture on May 26, 1960, and I also observed the outfall on April 14 and 15, 1960, and May 2, 23 and 26, 1960. This outfall also serves the same soap plant as shown in picture 31. At times it discharges relatively warm wastes. Some materials discharged from this outfall may be observed beside the outfall ditch. The characteristic color of the discharge is also shown in the slide. This black material has the appearance of a gelatinous material. It apparently was discharged when the river was in a higher stage. Consulting engineers have estimated that the average daily flow from this outfall was about 2.2 mgd, with a BOD population equivalent of 14,200 and suspended solids population equivalent of 2,000.

Q. May we have slide 33?

A. This is a picture of the discharge from Argentine Industrial District outfall No. 8. It discharges to the Kansas River. I took this picture on April 14, 1960. I also observed the outfall on May 23, 1960. It serves the railroad shops and yards and the presence of oil in this waste is evident in the picture, that reaches the Kansas River. The outfall line is owned by the Atchison, Topeka and Santa Fe Railway. Consulting engineers have estimated the flow from this outfall at about .21 mgd, BOD population equivalent at 27,700 and suspended solids population equivalent at 9,000.

Q. May we have slide 34, please?

A. This is a picture of Turkey-O.K. Creek Sewer outfall. It discharges into the Kansas River. It is also designated as Central Industrial District outfall No. 21. I took this picture on August 19, 1959, observed this outfall on December 7 and December 8, 1959, on May 2 and May 23, 1960, and on June 7, 1960. Characteristics of the wastes discharged from the outfall are of strong sewage and industrial wastes. Evidence of domestic sewage is indicated by the presence of feces, condoms and toilet paper. The outfall carries considerable oil and grease, as the sewer outfall shows in this picture. There is considerable foam and floating solids at times. Another characteristic of this outfall is its extreme odor. It was indicated that this outfall is owned by Kansas City, Missouri.

Q. Where does this waste come from?

A. Most of this comes from the Central Industrial District in Kansas City, Missouri.

Q. Are there any estimates on the flow?

A. Yes. Let's see if I have one here. I think I have one in the last picture of this outfall, Mr. Stein. Yes, I do. Do you want those now?

Q. No, we can get it then. Thank you. May we have slide 35, please?

A. This is a close-up picture of the same outfall, Turkey-O.K. Creek Sewer outfall, taken on the same day, August 19, 1959. The characteristic gray color of the sewage is evident here and you get a closer view of the grease and oil streaks on the outfall structure. The vapors are also visible in the south barrel of the sewer.

Q. May we have slide 36, please?

MR. POWERS: May I ask, did you take a picture December 7th of this same outfall?

A. Mr. Powers, this picture was taken on December 7th. This is No. 36.

MR. POWERS: Did you take the same view as you had on 35 and 34?

A. I probably did. I took several pictures on December 7th and, of course, I didn't bring all of my pictures over. They are available, however. This one was taken on December 7th. You notice--

MR. POWERS: Why did you select the one from August instead of the one from December?

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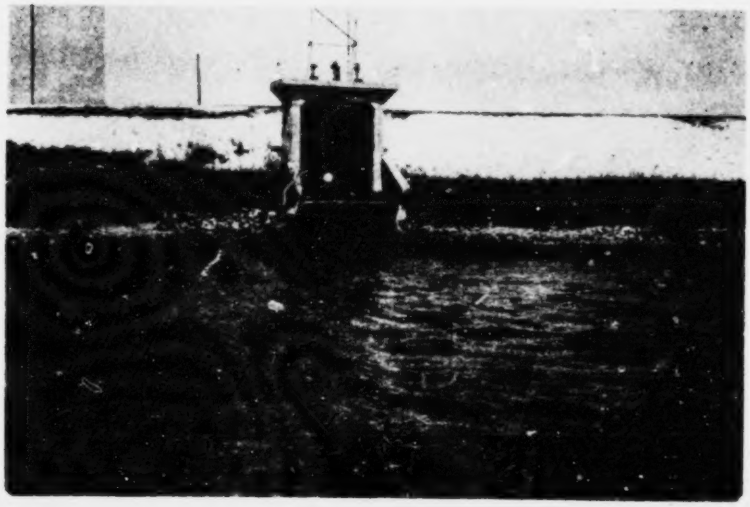
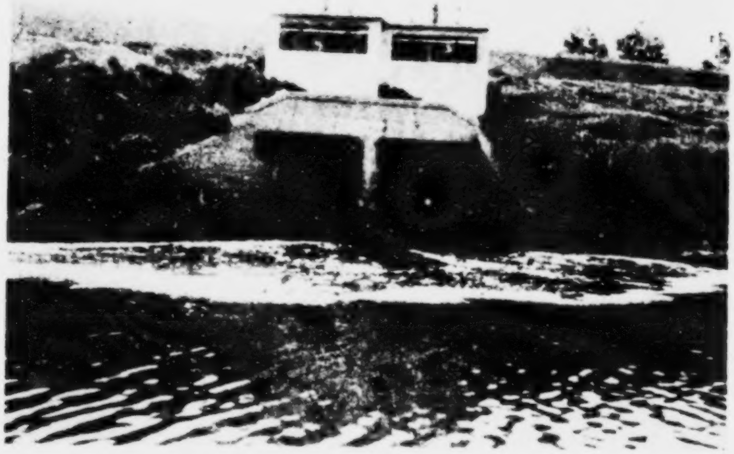


Jersey Creek Sewer Outfall Discharging to the Missouri River in Kansas.



Turkey-OK Creek Sewer Outfall Discharging to the Kansas River in Kansas.

A. Well--

MR. POWERS: Did it look worse?

A. It probably didn't look any better. I think they all look pretty bad. Well, as I indicated, I took this on December 7th. You see the characteristic gray-blue color of the discharge. This is from the north barrel of the sewer and you can see the orange peel and garbage next to the wall on the far side. This obviously was not garbage from a household. It hasn't gone through a garbage grinder, at any rate.

Q. (By Mr. Stein) Slide 37?

A. This is another picture of Turkey-O.K. Creek Sewer outfall. I took this picture on May 23, 1960. The characteristic gray color of the sewage is noticeable here, especially in the north barrel. It is also evident among the floating solids from the south barrel. The Public Health Service made a study of the Turkey Creek Sewer and they estimate the average daily flow to be 17.5 million gallons a day. It serves a population of 118,000, the BOD population equivalent was estimated at 206,000, and the suspended solids population equivalent at 200,000.

Q. May we have slide 38?

A. This is a picture of the Central Industrial District Sewer outfall No. 6. It discharges to the Missouri River in Kansas. It is also known as the Ohio Street Sewer. I took this picture on August 19, 1959. I also observed the outfall on May 23, 1960, and June 7, 1960. This is part of the Kansas City, Kansas, municipal sewerage system. The Missouri state line is a short distance downstream or to the left of this picture. A large part of the wastes discharged from this sewer is from a meat packing plant and from hog pens.

The red color of the wastes is due to the presence of blood from the packing plant. On June 7th when I observed this outfall from the bank I noticed pieces of dry congealed blood on the rocks beside the outfall ditch. The flow from this outlet is estimated at .3 mgd, the BOD population equivalent at 18,600, and the suspended solids P.E. at 51,100.

MR. SAMSON: How do you designate that on your exhibit, the Government Exhibit 14?

A. That is C-6.

MR. SAMSON: Thank you.

Q. (By Mr. Stein) May we have 39, please?

A. This is a picture of the Central Industrial District outfall No. 5. It discharges to the Missouri River in Missouri. It is also referred to as the Santa Fe Street Pumping Plant outfall. I took this picture on December 7, 1959, and I observed it on August 19, 1959, and on May 23, 1960. This is a part of the Kansas City, Missouri, municipal sewer system. It serves a packing plant and commercial and industrial areas.

MR. KOENIGSDORF: This outfall does not touch Kansas at any place, does it?

A. That is right, this is the Missouri River below the state line. You note the paunch manure against the wall of the outfall structure. There is also evidence of congealed grease on that wall. The white spots floating in the waste are pig toes. The flow has a slight red tinge from packing plant wastes. Consulting engineers have estimated that the average flow from this outfall is 6.78 mgd and the outfall line serves a sewered population estimated at 4,600, wastes for a BOD population equivalent of 11,000 and a suspended solids population equivalent of 43,600.

Q. (By Mr. Stein) May we have slide No. 40?

A. This is another picture of the same outfall, the Santa Fe Street outfall. I took this picture on December 7, 1959. The foamy nature of the wastes can be observed in the Missouri River as well as the steam and vapors rising from the wastes.

MR. SAMSON: How do you designate that on the Government Exhibit 14?

A. This is C-4.

MR. SAMSON: Thank you. That is entirely in Missouri, isn't it?

A. I beg your pardon, C-5. This is entirely in Missouri.

MR. SAMSON: Yes. All right.

A. C-5.

Q. (By Mr. Stein) May we have slide 41, please?

A. This is a picture of the Central Industrial outfall No. C-4. It discharges into the Missouri River in Missouri. It is also known as the Hay Press Sewer. I took this picture on December 8, 1959. I also observed the outfall on August 19, 1959, and May 23, 1960. The sewer is owned by the American Wiper and Waste Company. This company cleans wiper rags, such as colored cloths used in garages and service stations. The wastes appear to be high in solids and have considerable turbidity. This high turbidity is noticeable even in the highly turbulent Missouri River water. This outlet is estimated to carry a small flow averaging 0.1 million gallons a day. We have no figures on the strength of these wastes.

Q. May we have slide [illegible]?

A. This is a picture of the East Bottoms Sewer outlet No. E-1b. It discharges directly to the Missouri River in Missouri, is also known as the Main Street Sewer outfall. I took this picture on December 8, 1959. I also observed the outfall on August 19, 1959, and May 23, 1960. This is a part of the Kansas City, Missouri, municipal sewer system and discharges directly to the Missouri River immediately below the Grand Avenue Plant of the Kansas City Power and Light Company. The sewer serves a commercial area. The wastes are essentially domestic in nature. However, during the summer months it has been reported that this outfall carries considerable air conditioning cooling water. Consulting engineers have estimated that it serves a sewered population of 2,200, an average daily flow of 3.8 mgd, BOD population equivalent of 21,900, suspended solids population equivalent of 58,400.

Q. May we have slide 43?

MR. KOENIGSDORF: Just a moment, please. Mr. Clare, this outfall is down the river from Kansas, is it not?

A. Yes, it is.

MR. KOENIGSDORF: And the sewage flowing there does not touch the State of Kansas?

A. That is correct.

MR. KOENIGSDORF: Thank you.

Q. (By Mr. Stein) May we have slide 43, please?

A. This is a picture taken of the Blue River at the Manchester Boulevard bridge. I took this picture on June 1, 1960. The green scum at the left (indicating) is largely algae. The scum in the center is made up of grease and oil and bits of floating debris. The Blue River at this point has the appearance of a heavily polluted stream. You can see the gray color in here (indicating).

Q. May we have slide 44?

MR. KOENIGSDORF: Just one question, please. Mr. Clare, this does not touch the State of Kansas?

A. No, this is in Missouri.

This is another picture taken on the Blue River in Missouri. In the middle foreground is the Hawthorn Street Sewer outfall. I took this picture on May 23, 1960. The floating material in the outfall ditch is sludge, which has risen to the surface because of buoyancy induced by gas bubbles resulting from septic conditions.

MR. KOENIGSDORF: That same question, the same answer?

A. This is entirely in Missouri.

Q. (By Mr. Stein) May we have slide 45?

A. 45 is a picture of the Blue River trunk sewer outfall on the Blue River in Missouri. I took this picture on May 23, 1960, and observed the outfall on December 7, 1959. The outfall line receives wastes from several branch sewers, which in turn serve a large part of the southern portion of Kansas City, Missouri. It is designed to carry essentially dry weather flow from connecting branch sewers. At junctions of these sewers with this trunk there are overflow devices which carry excess flows of mixtures of sewage and storm water directly to the Blue River. Consulting engineers have estimated that this trunk serves a sewered population of 306,600. The flow is estimated at 26.65 million gallons a day. The BOD population equivalent is estimated at 208,000 and the suspended solids population equivalent at 281,000.

MR. KOENIGSDORF: This is even further downstream? You are going downstream away from Kansas, are you not, sir?

A. That is correct. This is on the Blue River above its confluence with the Missouri in Missouri.

MR. KOENIGSDORF: It is down river on the Missouri?

A. On the Missouri.

MR. KOENIGSDORF: Thank you.

Q. (By Mr. Stein) May we have slide 46?

A. This is a picture of a portion of the Kansas City, Missouri, refuse dump. It is on the bank of the Missouri River, on the south bank. I took this picture on May 23, 1960. I also observed the dump on August 19, 1959, and April 14, 1960. Note the refrigerators, washing machines and stoves that have been discharged in this dump. There is other large debris dumped in the river at this point. This is the Harry S. Truman bridge in the background.

Q. May we have slide 47, please?

A. This is another picture of the Kansas City, Missouri municipal refuse dump. This is again on the south bank of the Missouri River. I took this picture on April 14, 1960. I also observed this dump on August 19, 1959, and May 23, 1960. Although the bulldozer was not in operation on any of these dates that I visited this dump, evidence of its operation can be seen in the foreground.

Q. What kind of operation do you think is evident? What did the bulldozer do?

A. You can see the crawler tractor tracks which have pushed the refuse toward the river. The area relatively free of refuse was recently covered by high water of the Missouri River. Beyond the box in the center you can see some refuse which has not yet been carried away by the Missouri River.

Q. May we have slide 48?

MR. POWERS: Mr. Clare, isn't this so-called refuse dump what is called a sanitary fill which is covered up with earth when the material is deposited? And some of the metallic objects are near the river, but there is no sewage connected with it, is there?

A. Well, to answer your first question, this is not part of the sanitary fill. I understand that the sanitary fill operation, which is farther up the river to the left of this picture, handles materials which have been segregated by housewives and others as garbage. This is the refuse dump or what is left of it in this area.

MR. POWERS: It is covered up by earth, isn't it?

A. No, no.

MR. POWERS: As it is deposited?

A. No, not in this area, Mr. Powers.

Q. (By Mr. Stein) What happens to that material eventually? Does that get pushed into the river?

A. Well, this is evidence here (indicating). As I say, the bulldozer wasn't operating at any time that I was there, but there is evidence that this material was pushed over onto the banks of the Missouri River and the high water has carried most of it away.

Q. In other words, you would say that this material is covered up with water?

A. Or is carried downstream, yes.

Q. May we have slide 48?

A. This is No. 48. This is a picture of the Buckeye Sewer outlet. It is also known as No. N-9a on your exhibit. I took this picture on December 8, 1959. The Buckeye Sewer is part of the Kansas City, Missouri, municipal sewerage system, serves a portion of Kansas City North and carries essentially domestic sewage wastes. Evidence of domestic sewage can be seen in the presence of numerous condoms, fecal matter, bits of toilet paper and by the characteristic blue-gray color of the sewage. Immediately below this point, off to the right, this sewer ditch reaches Buckeye Creek, which flows into the Missouri River a short distance below. It is estimated that this sewer serves approximately 1,100 people and that the average daily flow is 0.1 million gallons per day.

MR. KOENIGSDORF: This sewage outfall is down river from the State of Kansas, is that right?

A. It is.

I believe that concludes the slides.

MR. STEIN: Mr. Chairman, at this point we would move that slide 20 to 48 be entered in evidence as government exhibits of those numbers respectively.

CHAIRMAN WILSON: They have already been received.

MR. STEIN: Thank you, sir.

Will you resume the stand, Mr. Clare.

Q. (By Mr. Stein) Mr. Clare, based on your investigations and analyses, would you say that the discharges from the parties named in the notice of this hearing are continuing substantially unabated?

A. Yes, I would.

Q. Would you consider the Missouri River in and below Kansas City and the Kansas River in the Kansas City area to be safe places for coming into contact with human beings who are engaged in such activities such as swimming, boating, fishing, and water skiing?

A. In my opinion these wouldn't be safe.

MR. KOENIGSDORF: Just a moment, please. I will object to that question as calling for a conclusion on the part of this witness.

MR. STEIN: I am calling for an opinion of him and I think he was qualified as an expert.

CHAIRMAN WILSON: Objection overruled.

Q. (By Mr. Stein) What effect, in your opinion, do the wastes from this Kansas Cities Metropolitan Area have on the water quality of the Kansas River and the Missouri River in and below the Kansas City area? Do they improve it?

A. In my opinion they degrade the quality.

Q. Would you consider the condition of the waters named in the previous question to be polluted?

A. I would.

MR. STEIN: We have no further questions of this witness.

CHAIRMAN WILSON: Any cross-examination, counsel?

CROSS-EXAMINATION

BY MR. POWERS:

Q. Mr. Clare, in your tabulation of your summary of the various outfalls and that you estimate the population by reason of the BOD and the population by reason of suspended solids, you have skipped one step, have you not?

A. Not to my knowledge, Mr. Powers.

Q. Well, don't you first have to get a finding by examination of the fluid as to the concentration of solids per million gallons or per weight, I mean, and also the concentration of the material represented by the BOD demand and apply that to the volume that you have shown here, the flow?

A. As I say, these figures were taken largely from the conslulting engineers' reports and from studies which the Public Health Service made.

Q. Well, if this were clear water, for instance here in Jersey Creek outfall of five million gallons a day, you wouldn't have the population estimate of 54,300, would you?

A. If Jersey Creek--

Q. That is just an example. If this were perfectly clear water, you couldn't make these population estimates based on suspended solids or BOD, could you?

A. I think you could on BOD. Perfectly clear water can have a biochemical oxygen demand.

Q. Well, then, if you do it with perfectly clear pure water, what is the significance of these figures?

A. I didn't do it with perfectly clear pure water.

Q. Well, isn't it true, Mr. Clare, that you estimate that, for instance, each person will contribute a certain amount of solids per day?

A. Yes, that assumption can be made.

Q. And you divide the total volume by that figure and you get, therefore, the estimated population, is that correct?

A. No, I don't believe so, Mr. Powers. The estimated population equivalent for BOD is ordinarily made or based on determinations, laboratory determinations, and it may have no relation to sewered population.

Q. That is what I am asking you, if you haven't got the determinations here. You have skipped that step, haven't you, with respect both to the BOD estimated population and the suspended solids population? There is a missing element here that somebody else has provided you with, is that right?

A. That is right. That is right. I did no laboratory work. These estimates are based on the--

Q. In other words, you have just taken some other person's figures as to the estimated solids per parts per million of estimated solids and parts per million of BOD demand and applied it to the volume, haven't you?

A. These figures were taken directly from their reports, in large measure.

Q. But you didn't make them?

A. No, I didn't make any analysis.

Q. You grant that there is a missing step here, do you not?

A. There is no reference in my testimony to any laboratory work that I did. Therefore, there is a missing step.

MR. POWERS: Very good. That is all I wanted to know.

CROSS-EXAMINATION

BY MR. KOENIGSDORF:

Q. Mr. Clare, with all of these numerous outfalls that we have listed that you have talked about, I don't know, it seems to me like there are probably over a hundred somewhere along the line--

A. I think so.

Q. --there is only one, is there not, which empties from the Kansas City, Missouri, sewer system into the river where it would touch the State of Kansas?

A. I believe that is right.

Q. That would be the Turkey Creek, is that right, O.K. Sewer?

A. Yes.

Q. That sewer starts in the State of Kansas, does it not, down here (indicating)? The flow into that sewer starts in Kansas, goes into Missouri and back into Kansas?

A. One branch starts in--

Q. Well, I am pointing now to, I think, the Turkey Creek Sewer. Do you know how much goes into the sewer at this particular area, the flow into that sewer and all those figures you had on--I am not familiar with all these terms, but you know what I am talking about.

A. Yes, sir. This sewer that you are referring to as coming in from Kansas is known as the Rosedale Sewer. It is estimated to have a flow of .72 mgd, a sewered population of 15,000, a BOD population equivalent of 8,250, and suspended solids population equivalent of 9,150. You will notice in the summary table that this item is marked with an asterisk and the footnote indicates that these figures were not included in the Kansas City, Kansas, totals.

Q. The Kansas City, Kansas, totals?

A. That is right.

Q. How did it get to Kansas City, Kansas.

A. It comes from Kansas.

Q. You include them in the Missouri totals?

A. Right, right.

Q. They come from Kansas?

A. That is right.

Q. Actually, although your line ends here (indicating), that actually sewers this area that lies south of the end of your red line, does it not?

A. That is correct. I think I indicated when I testified that the arrow at end of that trunk does not indicate that is the end of the line, that the line does extend from Kansas to that point and crosses the state line just below that point.

Q. You mentioned, sir, that this is combined storm sewage and sanitary sewage. Historically I think you have gone into that somewhat, have you not?

A. Yes.

Q. There is a diversion of storm sewage, is there not?

A. Yes.

Q. That is a diversion channel--do I point it out correctly here (indicating)--which was made under an agreement with the railroads?

A. The diversion channel to which I think you are referring is in this area (indicating).

Q. That is correct, I was wrong, it is down here (indicating); it diverts the storm water into the Kansas River up above the point that we are talking about. Mr. Clare, you have talked about how this, in your opinion, would not be suitable for certain recreational things, as I understand it, and drinking water. Actually there is no water intake for drinking water in this area, is there?

A. None to my knowledge.

Q. Have you, sir, ever heard or do you know of any--

CHAIRMAN WILSON: Just a minute, Mr. Koenigsdorf. You are pointing to the lower section of the Kansas River on what exhibit?

MR. KOENIGSDORF: This exhibit--I will have to find out--is Exhibit No. 18, sir.

Q. (By Mr. Koenigsdorf) Have you, sir, ever heard of or do you know of anyone who actually became ill or diseased because of drinking water from the Kansas River here (indicating)?

A. In that area?

Q. Yes, sir.

A. Not to my knowledge.

Q. Now, sir, if we are talking about boating, fishing and that type of recreation, assuming that these myriad other outfalls are cleaned up--still referring to Exhibit No. 18--on the Kansas River, by the very nature of this area would it be conducive to fishing, boating and swimming as a public recreation area generally?

A. By cleaned up do you mean that--

Q. With primary sewage treatment.

A. And the wastes from these outfalls given primary treatment and discharged back to the Kansas River?

Q. Yes, sir.

A. I don't think it would be good for all those forms of recreation, in my opinion.

Q. You still wouldn't probably go swimming there, would you, sir?

A. Probably wouldn't personally.

Q. No, sir. Regardless of the water, take the surrounding area and the type of development, railroads, and so forth, that are in there, would that lend itself to commercial recreation, by reason of its location I mean?

A. It is my opinion that there will be commercial recreation in the Kansas River. There is now.

Q. Well, let's limit ourselves to the part from Santa Fe--or, rather, the Turkey Creek-O.K. outfall down to the Missouri River.

A. Yes, I think it would apply to that, because, as I indicated, there is some recreation in there now, there is some boating. I don't recall having seen any water skiing there, but there may be.

Q. Do you know, Mr. Clare, if the figures that you took on BOD and suspended solids and population estimate were based upon water or effluent or whatever you call it taken from the Turkey Creek Sewer at its outlet or inside the sewer or where was the matter taken which was used in computing these figures?

A. I was not a part of the study team that studied the Turkey Creek Sewer. It was done by our sanitary engineering center. I would rather that one of those men would testify to that when they are on the stand.

Q. You believe there will be someone here who will be able to testify to that?

A. I am sure there will.

Q. But of your own knowledge you don't know where those samples were taken?

A. No. I could guess, but I would rather not.

Q. All right.

MR. KOENIGSDORF: Thank you, sir.

CHAIRMAN WILSON: Any other counsel for parties have any cross-examination?

CROSS-EXAMINATION

BY MR. BRENNEISEN:

Q. Mr. Clare, referring to the Government's Exhibit 15, the test page, do not those figures indicate about the Turkey Creek Sewer that less than five percent of that flow is from the Rosedale or the Kansas Sewer?

A. Let's see, now. The flow from the Rosedale Sewer is about five million gallons a day and from the Turkey Creek Sewer about sixteen and a half--seventeen and a half, so it is about--it is a little more than 25 percent.

Q. Well, do we have the same figures?

A. Oh. I am sorry, I was on the wrong line. Let me start over. The flow from the Rosedale Sewer is .72 million gallons a day and the total flow from the Turkey Creek Sewer is seventeen and a half, so it is--

Q. A little less than five percent?

A. Right.

Q. Don't those figures also indicate that the solids from the Rosedale Sewer are around five percent of the entire Turkey Creek Sewer?

A. Yes, they do.

Q. Don't those figures also indicate that the BOD is less than five percent from the Rosedale Sewer than from the entire sewer?

A. Yes, about that.

MR. BRENNEISEN: That is all.

CHAIRMAN WILSON: Any other questions?

MR. MURPHY: Mr. Chairman. I have the usual one or two questions, but it will take you past your adjournment time.

CHAIRMAN WILSON: Well, we will adjourn very shortly, but I want to find out if we can get through with this witness.

MR. MURPHY: I won't take long.

CHAIRMAN WILSON: Do you have some questions--

MR. MURPHY: I would like to ask him--

CHAIRMAN WILSON: --that will take any considerable time?

MR. MURPHY: I don't think so. I would just like to clarify one point.

CHAIRMAN WILSON: Well, I think we can run a few minutes overtime if necessary if we can get through with this witness.

Q. (By Mr. Murphy) Mr. Clare, directing your attention to Exhibits 14, 15 and 17 and the outfall unit that you have termed F-3a and related to Buick-Oldsmobile-Pontiac Assembly Division plant in the Fairfax Drainage District area, are you aware of the fact that that is just a two and a half-inch line?

A. Yes, I am. I think we list it that way in our table.

Q. Yes.

A. Yes, sir.

Q. Do you know the nature of the outfall from that line?

A. Of the wastes?

Q. Yes.

A. No, I don't. I know that they are white. They have the appearance of a slurry.

Q. If I suggest to you that it is nothing more than slaked lime, would you recall whether or not that you have been advised of that?

A. It has the appearance. It has that appearance, yes, sir.

Q. And do you know that that line was installed in May of 1950?

A. No, I didn't know when it was installed.

Q. In Exhibit 17 you commented that you could see it on the flow way of the river, that little white spot up there. I think the exhibit has now been placed back on the stand. Not the one on the left next to the green certificate, but two or three inches to the right of it.

A. (Indicating)

Q. Yes. Now, do you know that that flows most of the time, except under unusually high water conditions, into a ravine or a lagoon there on the flow way?

A. That is true.

Q. Yes.

A. When the river level is normal it is at some distance from the bank. However, it is on the river side of the levee.

Q. That is right. And that picture, Exhibit 17, is the normal time of the year, is it not, on the river?

A. Let's see, I don't know when this picture--it was taken in July and I assume that those are navigation flows.

Q. Now, the lime will settle out down into the ravine, will it not?

A. Yes, some of it will.

Q. Well, most of it will as indicated there. Now, when the river is high that doesn't go back into the solution to go out into the river?

MR. STEIN: Pardon?

MR. MURPHY: That which is deposited does not go back into the solution and out into the river.

MR. STEIN: Pardon me, I don't believe the witness said "most of it"; you said "most of it".

MR. MURPHY: Read him my question, please.

(Question read)

Q. (By Mr. Murphy) When the river rises and covers that deposit on the flow way, the lime that is deposited there doesn't go out and flow out into the river, does it?

A. I wouldn't think all of it would.

Q. It is just a solid at that time attached to the earth, isn't that right?

A. Well, I don't believe that it is firmly attached. I should think that some of it would be carried down river.

Q. Just one more question. Thank you. Do you know that at the time this was constructed, this outfall, that it was approved by the Department of Army, Corps of Engineers, the Missouri Division of Health, the War Assets Administration, the Fairfax Drainage District, the Kansas State Board of Health Division of Sanitation, the Missouri Conservation Commission and the Forestry, Fish and Game Commission of Kansas?

A. I didn't know that, but I am not surprised. That is the usual procedure.

MR. MURPHY: That is all. Thank you very much.

Oh, one other question.

Q. (By Mr. Murphy) I noticed on your Exhibit 15 you have no BOD indication there or suspended solids from this outfall. There is none, is that right?

A. Well, no, I wouldn't say there is none. We made no determinations and we could find no reference to it in the consulting engineers' report.

Q. At least your exhibit shows no BOD for BOP, is that right?

A. That is correct.

MR. MURPHY: Thank you.

Q. (By Chairman Wilson) Well, to bring this matter to a head, Mr. Clare, is it your opinion that the discharge from this particular outlet to which attention has just been called is making any contribution to the pollution load in the outlet water.

A. Well, I think it is a matter of relative size, Mr. Chairman. I made no attempt in this presentation to draw any line at what I thought might be significant. I thought that I would give the Board the facts as we found them and let the Board evaluate the importance.

Q. Well, but with reference to the duty of the Board to make a determination as to the responsibility of the respective parties here, it is important that we should know what, if any, pollution load is being discharged from the outlets for which they are responsible, and in view of the large number of such parties we may get to the point where we will have to have that evidence. If you are not able to give us a definite answer to that question as to whether the discharge from this particular outlet is contributing to the pollution load, is there someone else who can give us that information?

A. That is possible. The consulting engineers for that district might do it. At the same time it may be that since we did not find it in the consulting engineers' report they may feel it is relatively insignificant, I don't know. I think they should speak for themselves on that.

Q. Are we to understand that you are not expressing any opinion as to whether the discharge from this outlet contributes to the pollution load of the river?

A. That is correct.

CHAIRMAN WILSON: Do you have any further questions on this point?

MR. MURPHY: No, I have no further questions.

CHAIRMAN WILSON: I have another question on another point.

MR. MURPHY: I beg your pardon?

CHAIRMAN WILSON: I say do you have any further questions on this?

MR. MURPHY: No, that is the only question that I have.

CHAIRMAN WILSON: Does counsel for any other parties have any other questions on any other matters?

MR. STEIN: We have one question on redirect or two we would like to ask to clarify something on cross, but I don't think that will take long.

CHAIRMAN WILSON: Go right ahead.

REDIRECT EXAMINATION

BY MR. STEIN:

Q. Mr. Clare, computing the BOD's did you take into account the engineering reports as represented in Government Exhibits 3, 4, 5, 6 and 7?

A. Yes, I did.

Q. Do these give the basis of the computation of the figures?

A. These are the basis for the computation of all figures except the Turkey Creek outfall.

MR. STEIN: That is all.

CHAIRMAN WILSON: Members of the Board any questions?

Q. (By Mr. Samson) Would you step up to Exhibits 18 A and B, Mr. Clare, please. Would you point out where outfall C-6 is?

A. C-6 (indicating).

Q. All right. Now, with that pointer would you just outline generally the area, to the best of your information, that is serviced by that outfall?

CHAIRMAN WILSON: Now, just a moment. Would you describe so that it will show in the record where that outfall is located with respect to the outlet water, what it is in, and with respect to the state line?

A. Yes, sir. C-6 discharges directly to the Missouri River immediately west of the state line (indicating).

Q. (By Mr. Samson) That would be in Kansas, then?

A. In Kansas.

Q. Very well.

A. It is part of the Kansas City, Kansas Municipal Sewer System.

Q. And describe the area so that it may be in the record what that outfall services.

A. Well, it serves part of the Central Industrial District (indicating).

Q. You are now indicating in the State of Kansas or the State of Missouri?

A. In the State of Kansas. It has been indicated, as I remember the figure, that 90 percent of the waste carried by this outfall is from a packing plant, Armour's Plant.

MR. JOHNSON: In Kansas?

A. In Kansas.

Q. (By Mr. Samson) In what state?

A. Kansas.

Q. All right. Then the remainder of that sewer is serviced where.

A. In Kansas. As far as I know, to the best of my knowledge, it all serves an area of Kansas.

Q. I see.

A. It serves no part of Missouri.

Q. All right. Now, can you indicate generally on Exhibits 18-A and B the area that the sewers that you have indicated on Government Exhibit 14, C-7 to C-20, services?

A. C-7 is at the bend of the Kansas River about a quarter of a mile above its mouth (indicating). C-8, 9, 10, and so forth, to C--what, please?

Q. 20.

A. --20 is very close to the state line, at the bend of the Kansas River where it all but touches the state line. You have indicated there the river area. But what portion of the city? Would you point that out with your pointer and also describe it so that it may be in the record?

A. It serves the Central Industrial District (indicating), and to the best of my knowledge part of this is in Missouri on the stockyards.

Q. How much goes over the state line into Missouri?

A. Well, part of the stockyards area (indicating) would drain to these outfalls.

Q. How about C-7, 8 and 9, how far back from the Kansas River, that is how far to the east from the Kansas River or to your left on that Exhibit 18-A and 18-B, do those outfalls service?

A. Well, you are getting to a place now where I am afraid I can't draw the fine line, sir. It is my understanding that the outfalls C-7, 8 and 9 serve industry in Kansas, but the stockyards outfalls above those probably serve--I don't know, to my knowledge I don't know whether they serve part of Missouri or not.

Q. I believe you testified that it was your best judgment that part of them did serve this area of Missouri.

A. That is right, yes, sir.

Q. All right. Now, have you related to us the areas of water intakes for Kansas City, Kansas and Kansas City, Missouri?

A. I did on one of the government exhibits. I pointed out the Kansas City --may we refer to Exhibit 14? The Kansas City, Kansas, water plant is served by the outfalls in the group F-30 to 20, in that range. Do you find a cluster of outfalls on the Missouri River north of Kansas City, Kansas, F-20 to 30?

Q. Yes.

A. That is the area of the Kansas City, Kansas, municipal water and power plants. The Kansas City, Missouri, water plant is about two miles downstream across the river at N-1, almost due east.

MR. STEIN: Mr Clare.

A. Yes, sir.

MR. STEIN: Could you refer to Government's Exhibit 13? I think it will show it a little better.

A. Thank you. The Kansas City, Kansas, municipal water and power plant are shown on the bend of the Missouri River north of Kansas City, Kansas (indicating). The Missouri water plant is shown on the Missouri River about two miles east of that and across the river (indicating) north of North Kansas City.

Q. (By Chairman Wilson) And north of the confluence of the Kansas River and the Missouri River?

A. That is correct, a little east of north.

CHAIRMAN WILSON: Gentlemen, it is getting late.

MR. SAMSON: I have just one more question, Mr. Chairman, if you will bear with me.

Q. (By Mr. Samson) Where is the nearest water intake or water intake source below the confluence of the Missouri and the Kansas Rivers downstream?

A. It is not shown on this map.

Q. I appreciate that.

A. It is at Lexington.

Q. How far downstream is that?

A. Oh--

Q. Approximately.

A. About fifteen or twenty miles.

MR. SAMSON: Very well, that is all.

A. Maybe twenty river miles.

MR. SAMSON: Thank you. That is all.

Q. (By Chairman Wilson) Mr. Clare, it may be necessary to continue your examination tomorrow. I had a question that I wanted to ask you in line with some of your previous testimony. You had testified, as I recall it, before that the Turkey Creek outlet represented the major part of the discharge of pollution originating in Kansas City, Missouri, that went into the Kansas River, but just now in answer to Mr. Samson's question you have called attention to the fact that some of these outlets below the Turkey Creek outlet which serve the stockyards area also carry some pollution from Kansas City, Missouri. What I was going to ask you is this, and you may consider this overnight if you wish and give us an answer in the morning if you are able to: Are you able to give the Board figures or an estimate as to the proportion of the total pollution load discharging through all outlets into the Kansas River in Kansas which originates in Kansas City, Missouri?

A. Mr. Chairman, I will not have these figures of my own knowledge. If I get them, I would have to try to get them from consulting engineers, who I feel probably would give you this information better than I.

CHAIRMAN WILSON: May I ask the government if that information will be presented through some other witness?

MR. STEIN: We will make every effort to get these figures if we can get them. These outfalls go through sewers owned by the stockyards companies. We will endeavor to consult with the Kansas authorities, the Missouri authorities and you can be assured that you will have our best estimate before the conclusion of our case. If need be, we will have Mr. Hopkins, who will be recalled, analyze all these sources and come up with that estimate.

CHAIRMAN WILSON: I think it is becoming quite obvious from the way the situation has developed that that will be a very material issue for determination by the Board and it is for that reason that I am calling attention to it, so that if Mr. Clare is not able to testify to that we expect that whatever evidence may be available on that point will be submitted and that all the other interested parties may submit whatever evidence they wish on that same point also.

Before we adjourn, we have to ask Mr. Hopkins if he has any further announcement with reference to the boat trip.

MR. HOPKINS: I believe the weather forecast for tomorrow morning is cloudy with a chance for showers. The boat is covered and I think that even in light rain the trip still can be made. We will have cars in front of the Pickwick Hotel at twenty minutes of nine in the morning. We will go to the foot of Main at the dock there to get on the boat. I don't see that the trip can be concluded before noon. I think we will have to follow it by radio and probably meet you at some place along the river below Kansas City as soon as you have spent all the time that you care to on the river.

CHAIRMAN WILSON: What time do you think we could get back after the trip?

MR. HOPKINS: I think you will be doing well to get back, have lunch and reconvene at your 1:30 hour.

CHAIRMAN WILSON: Very well. Then with the understanding that everyone who wishes to go will be at the front door of the hotel at 8:40 a.m., we will now recess until 1:30 tomorrow afternoon.

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WHEREUPON, the hearing was adjourned until 1:30 o'clock p.m. of the following day, at which time the following further proceedings were had and entered of record, to-wit:

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AFTERNOON SESSION, TUESDAY, JUNE 14, 1960

CHAIRMAN WILSON: The hearing will come to order.

Mr. Stein, the counsel for Swift and Company has asked the privilege of asking some questions on cross-examination of Mr. Clare. Would you recall him to the stand, please?

MR. STEIN: Yes, we would. We would like to clarify the record.

Mr. Clare.

CHAIRMAN WILSON: Do you have any further examination of him?

MR. STEIN: Yes, we do.

CHAIRMAN WILSON: You proceed with that first and then we will proceed with this cross examination and have any other cross-examination after that.

MR. STEIN: Thank you.

HERBERT C. CLARE,

resumed the stand and testified further as follows:

REDIRECT EXAMINATION

BY MR. STEIN:

Q. Mr. Clare, you will recall that you are still under oath.

A. Yes, sir.

Q Mr. Clare, I would like to refer back to your computations in your in your previous testimony of population equivalents from all the sources of discharges you named in your previous testimony. On what basis did you make these computations?

A These computations were based on information contained in the consulting engineers' reports and on work that was done by the Public Health Service Sanitary Engineering Center. This last applies to the Turkey Creek study.

Q Was the basis of these computations contained in these engineering reports?

A Yes, they were. The engineers set up devices for measuring flows and waste discharges and laboratory work was done on samples and the analyses, results of the analyses, were applied to the quantities of waste discharged to arrive at the population equivalents.

Q. The engineers' reports you refer to were put in as Government Exhibits Nos. 3, 4, 5, 6 and 7. In other words, you would say that your tables avoided a duplication of the interim steps by which these computations were reached rather than omitting a step?

A. That is correct.

Q. Mr. Clare, I would like to refer you to the Buick-Oldsmobile-Pontiac plant where you refer to a waste discharge resembling a slurry, a lime slurry. In your opinion do you consider this a satisfactory method of waste disposal?

A. No, I shouldn't think it would be.

Q. Why not?

A. It seems that waste of this type should receive treatment in the way of sedimentation so that the solids could be retained in the treatment process instead of being discharged to the river bank.

Q. You pointed out in your summary that these discharges were swept into the river during periods of high flow?

A. I didn't observe this area when the river was at high flow or in flood stage, but it is on the river side of the levee, the discharge is on the river side of the levee, and therefore subject to being swept clean by a flood action.

Q. Mr. Clare, I would like to refer you now to the Turkey Creek diversion ditch. Would you refer to Exhibit No. 18 and indicate to us where the Turkey Creek diversion ditch is?

A. The Turkey Creek channel can be seen on this exhibit in the extreme lower left corner flowing in a northeasterly direction, a little east of north is the direction, to a point about a half mile or a quarter of a mile from the Kansas River, at which point it is diverted through a tunnel under the hill to a point on this exhibit marked as C-25.

Q. That is in the lower left-hand corner?

A. That is correct, yes, sir.

Q. Is that distinguished from the outfall of the Turkey Creek Sewer?

A. It is.

Q. Will you point to the outfall of the Turkey Creek Sewer?

A. Turkey Creek Sewer outfall is at point C-21.

Q. Would you refer back again to the Turkey Creek diversion ditch outfalls?

A. (Indicating)

Q. Will the record note that Mr. Clare is pointing to point--

A. C-25

Q. --C-25 of Government Exhibit No. 18. You will recall that there was some questioning of you on cross-examination about the ownership of the Turkey Creek diversion ditch?

A. That is correct.

Q. Have you stated or does your summary state that any sewage or industrial wastes enter the Kansas River from the Turkey Creek diversion ditch?

A. No, it does not.

Q. Your summary does indicate, however, that considerable sewage and industrial waste enters from the Turkey Creek Sewer?

A. That is correct.

Q. Thank you, Mr. Clare. Now, Mr. Clare, I would like you again to refer to Government Exhibit No. 18 and consider discharges C-20 to C-15, and indicate, if you can, what material is coming from these discharges, where they are located, and what percentage is coming from Kansas, and the percentage coming from Missouri.

MR. SAMSON: Can I have that question back again?

(Question read)

MR. SAMSON: Very well. Thank you.

MR. KOENIGSDORF: Mr. Chairman, may I ask that the witness be qualified as to the basis of his knowledge or if it is just hearsay?

MR. STEIN: Yes.

CHAIRMAN WILSON: Well, you may cross-examine him. Do you want to cross-examine specially now or just reserve that point until you--

MR. KOENIGSDORF: He has called for an answer to a question which he has not been qualified for and I was only asking that he be qualified as to his knowledge.

CHAIRMAN WILSON: He may answer if he knows.

MR. STEIN: Yes. Mr. Chairman, we believe the witness stated the basis of his studies previously, but I would amend the question to include that.

Q. (By Mr. Stein) Could you, in answer to the question, give the basis of your knowledge and information?

A. Well, this is based on conferences with the consulting engineers who have studied these outfalls and observation of the area served--

Q. Would you name the consulting engineers, Mr. Clare?

A. Truman Schlup. --the knowledge of the area served and the nature of the wastes discharged.

Q. Would you proceed?

CHAIRMAN WILSON: What outlet numbers does that refer to?

MR. STEIN: C-20 to C-15.

CHAIRMAN WILSON: You have named those in reverse order, then?

MR. STEIN: In reverse order.

CHAIRMAN WILSON: It is C-20 to C-15, inclusive?

MR. STEIN: Inclusive.

Q. (By Mr. Stein) You will recall that these outfalls, as shown on Government Exhibit No. 18, are on the right bank of the Kansas River, C-20 being in closest physical proximity to the Missouri border and C-15 being farthest away from the Missouri border, all the outlets in Kansas. Mr. Clare, would you proceed.

A. Based on the conference with the consulting engineers and observations in the area, it is my opinion that 20 percent of the wastes discharged through C-15 would be from Missouri.

CHAIRMAN WILSON: How much did you say?

A. 20 percent. For C-16 I estimate that the wastes from--

Q. (By Mr. Stein) Mr. Clare, in going over these discharges, do you have the quantity on the amount of wastes coming from these or just percentages?

A. The quantity is shown in Exhibit--is it 15, the summary and table?

Q. I suggest, if we can, we give the quantity and then the percentage and characterize the type of waste, if you can, Mr. Clare.

A. These are all--

MR. SAMSON: Wait a minute.

Q. (By Mr. Stein) All right, Mr. Clare.

A. All these outlets are Kansas City Stockyard Company outlets serving the Kansas City Stockyard property, stock pens and buildings which lie on both sides of the state line in this area.

I estimated that 15 percent of the flow from C-15 is from Missouri. The flow in the summary table for C-15 is .2--

MR. SAMSON: What did he say, 15 percent this time?

A. 20 percent. C-15, the flow is 20 percent. I am sorry.

Q. (By Mr. Stein) Mr. Clare, I think there might be a little confusion. May I repeat that? You say C-15, 20 percent from Missouri?

A. That is correct.

Q. All right.

MR. SAMSON: All right.

A. And the flow from this outfall in the summary is .251 mgd. This would be, then, a flow from Missouri of .05 mgd.

For C-16 I estimate that 40 percent is from Missouri. The flow in this outfall is given as .659 mgd, from Missouri would be .264.

From C-17 I estimate 60 percent from Missouri. The total flow is .412. Then from Missouri it would be .247.

C-18 I estimate 80 percent--

CHAIRMAN WILSON: How much?

A. 80 percent from Missouri. The total flow is .037, from Missouri .03.

C-19 serves the Kansas City Livestock Exchange and the Golden Ox Restaurant, both of which are in Missouri. I estimate the flows from Missouri at 90 percent. The total is .211. Therefore, from Missouri the flow would be .19.

No. 20, I estimate that all of the flow is from Missouri. This flow is .022.

This means that a total flow from these six outfalls, amounting to 1.59 mgd, .8 mgd are from Missouri, or one-half.

Q. (By Mr. Stein) Mr. Clare, would you characterize the type of wastes coming from these outfalls?

A. Well, these are drainage from the stock pens and from buildings and from the ground surface in the stockyards area.

Q. In other words, you would say they were from domestic and stockyard waste operations?

Q. Mr. Clare, I would like to refer your attention to Government Exhibit No. 18, outlets marked C-7 to C-14 discharging into the Kansas River in Kansas. Would you say that these wastes largely serve Kansas?

A. Yes, I would. I do.

Q. There are no significant wastes from Missouri in these outlets?

A. There undoubtedly are some from Missouri, but I would say the significance is very small.

Q. Mr. Clare, I would like to refer your attention to Government Exhibit No. 17, specifically outlets N-1 to N-3, and ask you to describe those outlets, characterize the type of waste from each, from whence they come, and to relate that to a position on Government Exhibit No. 13.

A. May I refer first to Government Exhibit 13? The area covered in the photograph, Government Exhibit 17, is the lower end of the Kaw bend of the Missouri River, which is approximately three miles or four miles above the mouth of the Kansas River, to about the center portion of the Kansas City, Missouri, municipal airport.

Q. This is the place, is it not, Mr. Clare, where the Missouri River lies between the boundaries of Kansas and Missouri and forms a part of or flows across the state boundary?

A. That is correct.

Q. Would you describe these outlets?

A. N-1 is an outlet from the Kansas City, Missouri, water treatment plant. The nature of the wastes from this outlet are discarded filter washings and spent materials used in chemical treatment of water.

N-2 is a municipal outlet from North Kansas City. This is a combined sewer and it serves an industrial, commercial and residential area in North Kansas City.

N-3 is a storm water outlet which is used when there is storm water on the Kansas City, Missouri municipal airport. When there is no storm water, the outlet on the airport, N-3, is dry.

MR. STEIN: Thank you, Mr. Clare. We have no further questions of Mr. Clare at this time.

CHAIRMAN WILSON: Counsel may cross-examine. First I will ask counsel for the city if they have any cross-examination at this time. Then I want to permit counsel for Swift and Company to ask the questions he has in mind.

MR. KOENIGSDORF: I would like to inquire, if you please, sir.

RECROSS-EXAMINATION

BY MR. KOENIGSDORF:

Q. Mr. Clare, this N-1, is it, from--is that municipal airport?

A. No, N-1 is from the municipal water treatment plant, Kansas City, Missouri.

Q. Do you find any BOD content there that is sizable?

A. We found no reference to this outlet in the consulting engineers' reports. Therefore, the summary table or the tabulation of data of flows has no figures on flow and we made no measurements.

Q. And the municipal airport has a treatment plant, does it not, for sewage from there?

A. Not to my knowledge. However, N-3 is not--

Q. Is not measurable?

A. --a sewer outlet.

Q. That is storm water, is it not?

A. That is right.

Q. So you are not speaking of pollution on that, are you?

A. No, sir.

Q. The items that you mentioned from Missouri, and you set up percentages on C-15, and so on, how did you arrive at your percentage as far as C-15 is concerned?

A. Well, it was arrived at after conference with the consulting engineers and observation of the area.

Q. When was that conference held, sir?

A. Last night.

Q. No. I have been over there.

Q. Well, what area does C-15 serve, Mr. Clare?

A. I don't know the exact limits of the area served by C-15, but it would be the area immediately back of the sewer outfall, the stockyards area. The stockyards property line is approximately--I don't know the name of the street, but at least a part of it is in Missouri and part in Kansas. I don't have the exact limits.

Q. This is highly conjectural, is it not, if you don't know the limits of the area, as to how much percentage of the sewage flows from Kansas and from Missouri?

A. Well, it is true that I didn't measure it.

Q. It is just an offhand guess on the part of you and the engineers?

A. Well, it is an estimate.

Q. Is the same thing true of C-16?

A. That is correct, yes, sir.

Q. And C-17?

A. Yes, sir.

Q. 18?

A. Yes, sir.

Q. 19?

A. Correct.

Q. And was that the last one that you mentioned?

A. 20.

Q. and 20?

A. Yes.

Q. Now, sir, those sewer outfalls that you have mentioned that I have just enumerated are not operated by the municipality of Kansas City, Missouri, are they?

A. No, they are not.

Q. They are not maintained or operated, to your knowledge--

A. Not to my knowledge.

Q. --nor are they owned by Kansas City, Missouri?

A. That is correct.

Q. Now, sir, let me ask you this. Did you in your estimating make any estimate as to the percentage flow of the sewage originating in Missouri going into the Kansas River between the Turkey Creek outfall and the mouth of the Kansas River? You have some M's in there and some AM's and C's and other numbers.

A. Of course the Armourdale Industrial District outfalls are on the left bank of the Kansas River. The Central Industrial District outfalls are on the right bank of the Kansas River. And your question is, was any estimate made of the total discharge of waste?

Q. Percentage of the waste from Turkey Creek outfall as compared with all of those other outfalls up to the time the Kansas River reaches the Missouri River?

A. I didn't make that calculation. The figures are in Exhibit 15.

Q. It would be a rather small part, wouldn't it, comparatively?

A. I should think it would be quite a significant part.

Q. You didn't measure that or compute it?

A. No, I didn't.

Q. I want to clarify, there has been some question raised as to cross-examination yesterday on the Turkey Creek drainage ditch and I believe that when I asked you yesterday I was only asking in relation to storm water, was I not, where you nad stated in your direct examination that there was combined storm water and sewage in the Turkey Creek Sewer, which I agreed with except to state that a great part of the storm water of Turkey Creek had been diverted before it gets into where it would go to the sewer outfall, in fact it doesn't go to the sewer outfall, isn't that correct?

A. The storm water from the Turkey Creek water shed to the south and west of the point of diversion is largely carried by Turkey Creek through the diversion to the Kansas River. The storm water in the Central Industrial District along the Turkey Creek channel before diversion is carried through the outfall.

Q. I think we are in agreement now. That was the question yesterday, was on the diversion before it got into the sewer of Turkey Creek. Sir, do you know what type of tests were used or made in arriving at this BOD and suspended solid figure you have, in arriving at these figures which you say were the ultimate and you did not use the intermediate steps?

A. The suspended solids and BOD tests are determined in accordance with the standard method of analytical procedure for water and sewage works. These procedures were followed by the consulting engineers in their studies. Now, some estimates can be based on other than laboratory tests. For example, a sewered population figure can be based on the engineers' estimate of the population served by a sewer or a sewer district and, if industrial wastes are not present, the calculation of BOD population equivalent can be made from this figure.

Q. Are there different ways of testing these things?

A. Well, the usual method, and the one which I understand was used in these studies, is the standard method referred to in the Standard Methods Analysis for Water and Sewage.

Q. How was that test performed, sir?

A. Is this the BOD test, for example?

Q. Well, we might take them both just to educate us a little bit on how it is done.

A. Well, the BOD test is made by putting a sample or a portion of a sample in what is known as BOD dilution water, on which a measurement of dissolved oxygen is made. This is incubated for a five-day period at a temperature of 20 degrees centigrade and again the dissolved oxygen is determined and the depletion in oxygen is a measure of the BOD, the oxygen demand of the sample tested.

Q. Now the suspended solids.

A. The suspended solids are measured by filtering a sample to find out how much solids are actually suspended in the liquid and this is done gravimetrically.

Q. Would it depend a lot on the condition of the water regardless of sewage as to your suspended solids result? If you had muddy water, would it be a different figure than if it were ordinarily clear or semi-clear water with sewage in it?

A. Muddy water, of course the turbidity in muddy water would show up as part of the suspended solids.

Q. That wouldn't show in here as to any outside characteristic that would change the figure, would it? I mean if it were muddy water you would have no way of knowing in these figures that were used by you for suspended solids?

A. No--these analyses were made on the wastes being discharged to the river and if the wastes are muddy, the suspended solids' determination would include that.

Q. You can't tell from your figures the condition that prevailed at the time of the testing, can you, sir?

A. I can't tell from the figures whether or not part of the suspended solids were silt or mud or other particulate matter.

Q. I don't note it here; did you use the chloroform test in this at all?

A. The chloroform soluble determinations which are reported on the summary sheet were made on samples which were sent to Washington University for analysis.

Q. Well, are there different ways of testing chloroform solids?

A. Not to my knowledge. This is a procedure which I did not do. There will be someone who will testify on this part of the analysis later on.

Q. You aren't standing behind these figures particularly, then?

A. I have full confidence in the figures, but--

Q. But you don't know how they were arrived at?

A. I didn't take the samples and I didn't do the analysis. These will be reported by someone else.

Q. Are you familiar with the activated carbon, and so forth, part of the tests on chloroform solubles?

A. Generally, yes, sir.

Q. If your test is taken in one way, straight from the water, why, you get a different result than if you run it through the carbon and take the solution from the carbon, do you not?

A. Well, these chloroform soluble extract determinations were made from carbon adsorbed samples, I know that.

Q. You are certain of that, sir?

A. Yes.

MR. KOENIGSDORF: No further questions.

CHAIRMAN WILSON: Counsel for Swift and Company wanted to ask some questions.

MR. SOLLO: I am not an attorney, sir. In the absence of our attorney I wanted to ask a couple of questions, though.

CHAIRMAN WILSON: Go ahead.

MR. SOLLO: F. W. Sollo.

CHAIRMAN WILSON: What was that name, please?

MR. SOLLO: Sollo.

CHAIRMAN WILSON: How do you spell that?

MR. SOLLO: S-o-l-l-o.

RECROSS-EXAMINATION

BY MR. SOLLO:

Q. Mr. Clare, yesterday a number of slides were shown which you described generally. One of these slides showed an outlet which is noted as AM-18 and this you referred to specifically as carrying the wastes from Swift and Company, is that not right?

A. That is correct.

Q. In a number of other instances you referred to sewers as carrying the wastes from large packing plants or a packing plant. Is it not true that with the exception of AM-18 these wastes to which you refer are from packing plants other than Swift?

A. That is correct.

MR. SOLLO: That is the only point we wanted.

CHAIRMAN WILSON: Any other cross-examination?

Members of the Board?

Q. (By Mr. Salome) I would like to ask, please, if you would roughly find again for us on the map that territory of Turkey Creek in Missouri and that part in Kansas. In other words, I know you probably--in other words, the sewer part.

A. The sewer line per se is shown by the red mark that is picked up in Kansas, flows across the state line generally along Southwest Boulevard to--I don't know how to describe this point--for approximately a mile, at which point it leaves Southwest Boulevard and follows the railroad tracks, the channel of Turkey Creek, to its confluence with the Kansas River. Now, the sewage which is carried from Kansas to the Kansas River through the Turkey-O.K. Creek outfall is carried through the line that crosses the state line at the lower end of the red line and that is, as I indicated yesterday, about five percent or a small amount of the total flow.

Now, the sewage waste carried by Turkey Creek from Missouri is from an area in Missouri which lies generally south of the Union Station--or what is this here?--memorial hill area and is largely domestic and commercial and industrial. Of course the Turkey Creek-O.K. Creek outfall line also carries wastes from the O.K. Creek Sewer, which is also industrial and commercial and some residential.

Q. About what is the mileage in Kansas there of where the outlet is from the Missouri line--no, no, up at the other.

A. (Indicating)

Q. Yes.

A. Oh. Well, I would estimate that at about two to three miles.

Q. You mean the whole--

A. From the outlet to the state line.

Q. No, I mean from where it enters back into Kansas over to the river, how much of that is in Kansas?

MR. STEIN: Right here (indicating).

A. Oh, this short strip?

Q. (By Mr. Salome) That is it.

A. Oh, less than a quarter of a mile.

Q. All right. Then the whole area from where it enters into Kansas is two or three miles, is that what you say, that is from there to where it enters Kansas again?

A. (Indicating) to (indicating), I would say so, yes.

MR. SALOME: All right.

CHAIRMAN WILSON: Any other questions?

Counsel.

Q. (By Mr. Murphy) Mr. Clare, I am sorry I wasn't here, but I understand that you expressed an opinion as to the nature of the lime deposit that comes from BOP's sludge line at F-3a. Would you kindly repeat your opinion on that?

A. I indicated that the slurry which is discharged through the BOP line through the dike onto the banks of the Missouri River is subject to treatment and probably should be treated, that in my opinion it should be treated before being discharged onto the river side of the levee, that probably the solids should be settled out or removed and the clarified effluent carried either to a district sewer or, if necessary, to the river.

Q. Well, it is only slake lime from an acetylene generation and that settles down in the ravine into which the line discharges, isn't that right, at normal water levels?

A. It is on the bank here, that is correct. It is on the flood plain of the Missouri River. There is a drainage channel that does reach the Missouri River.

Q. Now, in and of itself that isn't a pollutant, is it, in the sense that this hearing is engaged in here?

A. Well, it is relatively small.

MR. STEIN: Mr. Chairman, I don't think that we can ask Mr. Clare to determine in and of itself what is a pollutant. The question of pollution is a conclusion to be drawn by the Board and I think that is a question of argument and discussion.

CHAIRMAN WILSON: Well, the witness may answer the question so far as he has an opinion on it, and you may ask him any questions you like on redirect examination, if you want to clarify it.

Do you want further answer?

MR. MURPHY: If he can answer that, Mr. Chairman, I would appreciate it.

A. I think that it should be considered as a pollutant. It is a waste that should have treatment before it is discharged to the river.

Q. (By Mr. Murphy) It is not a sewage waste, is it?

A. Yes, I should think that if you class industrial wastes as sewage wastes, it is.

Q. That is what I am getting at, it is an industrial waste and outfall as distinguished from your sanitary sewage and other type of sewage from the other industries?

A. You are correct, this is not a domestic or sanitary waste. This is an industrial waste.

Q. And to what extent is it a pollutant?

A. Well, it is a foreign material that is being discharged to the river, just as others are. It is subject to primary treatment.

Q. If you cut down a tree at that point and threw the tree in the river, to that extent the tree is a pollutant, is that right?

A. I don't think that sanitary engineers would ordinarily class them as that.

Q. It is a foreign body in the river?

A. The tree is, yes, sir.

MR. MURPHY: So is the lime. That is all.

MR. SAMSON: Are you all through?

MR. MURPHY: Yes, sir.

Q. (By Mr. Samson) I have a question or two. Is there a packing industry located generally in the area between the points of C-6 and C-7? And refer to Exhibit 18.

A. C-6 to C-7?

Q. Yes.

A. Yes.

Q. Is there an industry in there?

A. Yes.

Q. What what industry is in there?

A. Well, the Armour plant is in this area.

Q. That is on the Kansas side, isn't it?

A. The plant is located on the Kansas side, as I understand it, of the line.

Q. Now, does that plant discharge its industrial waste into the outfall C-5?

A. Part of it. Part of that waste does go, to the best of my knowledge, from Arnour's plant in Kansas to this outfall. I referred in this picture that I showed, I forget the name of it, yesterday to the pig toes that were being discharged through the Santa Fe Sewer. It is my understanding they are from that plant.

Q. What else, then, on the Kansas side in that area generally discharges into the sewer which has an outlet designated as C-5?

A. To my knowledge, that is all, sewage from part of this plant.

Q. In Kansas?

A. Yes, sir.

Q. And where does the rest of its wastes go, then, into what outfall?

A. C-6, essentially.

Q. And C-6, is that on the Kansas side of the line or on the Missouri side of the line?

A. It is on the Kansas side of the line, just barely. It is a Kansas City, Kansas, sewer line.

CHAIRMAN WILSON: Other questions by members of the Board?

Go ahead, Mr. Poole.

Q. (By Mr. Poole) I hate to come back to this lime slurry, but approximately how much is there of that? I notice the table here says a two-inch pipe. We are talking about F-3a, aren't we?

A. That is correct. That is correct, F-3a. I know of no flow measurements or any solids measurements on those wastes.

Q. Well, is it 10,000 gallons a day, 100,000 gallons, or a million?

A. I would say certainly it is probably less than 10,000 gallons a day.

MR. POOLE: All right. I have one more.

CHAIRMAN WILSON: Go ahead.

Q. (By Mr. Poole) In the question regarding Swift and Company's waste, you answered Mr. Sollo that AM-18 carried all of Swift and Company's wastes. Your table in Exhibit 15 has AM-19 also.

A. I misunderstood Mr. Sollo's question if I answered that way.

Q. Perhaps I misunderstood it.

MR. SAMSON: No, he answered it A-18.

MR. SOLLO: I was talking about the slides.

A. There are two outlets from Swift and Company's plant and I showed one, the larger one, in the slides. I understood Mr. Sollo's question to ask me if any of the other wastes shown in the slides were from Swift and Company.

MR. SOLLO: That is right.

A. And I said no.

Q. (By Mr. Poole) But there are two Swift and Company outlets?

A. That is right.

MR. POOLE: That is the point I wanted to clarify.

That is all.

CHAIRMAN WILSON: Any other questions?

Then I have a question or two of Mr. Clare.

Q. (By Chairman Wilson) It is not clear from your testimony yesterday and today that the sewage or industrial waste which enters the Kansas River from the City of Kansas City, Missouri, falls into two general categories, that is industrial and domestic or municipal sewage. That is true, is it not?

A. It does, yes, it falls in those two categories.

Q. Now, the bulk of what you might classify as--well, strike that out. These outlets C-16 to 20 are private industrial outlets, you said?

A. Yes, sir.

Q. They are not operated by either of the cities?

A. That is my understanding.

Q. And they carry principally industrial wastes, with perhaps some domestic wastes from the industries?

A. That is correct, from the buildings.

Q. And I think you stated in response to Mr. Koenigsdorf's question that although you didn't estimate the percentage of the pollution from those outlets, they constitute a significant part of the pollution in the Kansas River?

A. They do, yes, sir.

Q. Now, referring to the wastes entering through the Turkey Creek outfall, those red lines lead down to that outfall from what I understand you to say now are the main trunk line sewers, are they not?

A. They are the main trunk line sewers leading to this outfall, yes, sir.

Q. And connected therewith are various local sewers serving the adjacent territory?

A. That is correct.

Q. In both cities?

A. That is correct, yes, sir.

Q. That is, that small piece that extends over to the southwest there from the south branch is connected with a number of local sewers that serve that part of Kansas City, Kansas?

A. That is correct.

Q. And you estimated that about five percent of the total discharged into the river comes from Kansas City, Kansas?

A. That is correct.

Q. The remainder from Kansas City, Missouri?

A. That is correct.

Q. Those trunk lines and local sewers, are those parts of the municipal systems of those respective cities?

A. They are.

Q. And which of the two cities owns and operates the outlet?

A. Missouri. Kansas City, Missouri, to my knowledge, owns and operates and is responsible for the outlet.

Q. There is some legal arrangement, is there, whereby they can operate that outlet, even though it is in the State of Kansas?

A. That is my understanding. I understand that the laws of the two states permit such an arrangement and that this is the arrangement

Q. At any rate, that is municipal sewage discharged through that outlet from both cities?

A. Yes. It is a municipal responsibility. It is domestic and industrial waste, municipal sewage, some from Kansas, most from Missouri.

Q. Now, your tables, I think, would show the comparative pollution load between what is discharged out of the Turkey Creek outlet and out of those other industrial outlets C-16 to 20, inclusive, but can you give the Board a general summary of that comparison? In other words, how does the total pollution load in population equivalent from the Turkey Creek outlet compare with that from these other five outlets of private industries?

A. I can add that up in just a minute. May I ask, do you want all the figures, Mr. Chairman, the flow and BOD population equivalent?

Q. No, I don't care for the detail.

A. Okay.

Q. I would just like to have a summary of the relative weight or volume of the comparative pollution load as between those two classes of outlets, that is the Turkey Creek outlet on the one hand and those five industrial outlets, C-16 to 20, on the other.

A. Mr. Chairman, the flow from the Turkey Creek Sewer outfall as given in the tables is 17.5 mgd. I added the flows from C-15 through 20 and it comes out 1.6 mgd, which is about one-tenth. The P.E. BOD for Turkey Creek-O.K. Creek Sewer outfall is given in the table as 206,000. I added the BOD P.E.'s for C-15 through 20 and the figure is 6,850. That is about three percent.

Q. I don't suppose you have pursued that calculation further so that you could give us the proportion between some of these two pollution loads and the total pollution load of all the outlets on the Kansas Rive, have you?

A. I haven't done that, no, sir.

Q. Could you do it?

A. It could be done, yes, sir.

Q. Without taking any time now, will you do that and if recalled sometime later during this session give us that figure?

A. You want the comparison of the flow from Turkey Creek outfall to all the outlets into the Kansas River?

Q. And the same as to these outlets C-16 to 20.

A. All right.

Q. You stated here a little while ago in answer to Mr. Koenigsdorf's question that you considered that the discharge from these industrial outlets was a significant part of the pollution load of the Kansas River, if I understood you correctly?

A. That is correct.

Q. Although you didn't give the proportion?

A. No, sir.

Q. But it occurred to me that that was capable of calculation.

A. It is.

Q. And I think it would be of interest to the Board to know as closely as possible how that comes out.

A. All right, sir.

Q. I assume, of course, that in view of these figures you have just given us the discharge from the Turkey Creek would be a quite significant part of the total pollution load of the Kansas River.

A. Yes, indeed, it will.

Q. Have you in mind roughly what that proportion would be?

A. I don't think that I could go any further at this time than to say it is very significant, but I would be glad to make the calculation.

Q. Will you do that, please?

A. I will.

Q. And present it later?

A. Yes.

CHAIRMAN WILSON: Any other questions?

MR. SAMSON: I have a question.

Q. (By Mr. Samson) Mr. Clare, in connection with C-15 to C-20, and referring now to Government's Exhibit 18, is there any domestic waste, have you observed any domestic waste, coming out of those outfalls?

A. Well, yes, there is domestic waste coming out, especially at C-19, which serves the Livestock Exchange Building of the Kansas City Stockyards Company.

Q. What state is that located in?

A. That is in Missouri. And the Golden Ox Restaurant, which is in Missouri.

Q. Does that process any other territory besides that cafe and that exchange building?

A. Well, probably some of the stockyard pens between those buildings and the outfall.

Q. And what state is that located in?

A. Well, they are largely in Missouri, some in Kansas.

Q. To your knowledge are there any laterals that go out into the town proper, that is in Missouri, and tie in to that sewer which is connected with with that outfall you have just referred to?

A. Beyond the property of the Kansas City Stockyards Company?

Q. Yes.

A. Not to my knowledge.

Q. Well, now, that was C-19, wasn't it?

A. Yes, sir.

Q. What about C-18?

A. Well, these all belong--C-15 through 20 are all privately-owned sewers of the Kansas City Stockyards Company and to my knowledge they don't serve any of the municipality.

Q. Where is the waste carried, if you know, immediately adjoining the Golden Ox Cafe and the exchange building there, if you know?

A. No, I don't.

MR. SAMSON: Very well. Thank you very much.

CHAIRMAN WILSON: Any other questions?

That is all, Mr. Clare.

MR. KOENIGSDORF: You have reminded me of one more question, if I might, please.

CHAIRMAN WILSON: All right.

RECROSS-EXAMINATION

BY MR. KOENIGSDORF:

Q. You investigated this Turkey Creek ownership and operation and maintenance. Do you know that Kansas City, Kansas, has the right to hook in without the consent of Kansas City, Missouri, either in Missouri or in Kansas, to the Turkey Creek Sewer?

A. No, I didn't know of that right specifically.

MR. KOENIGSDORF: Thank you.

CHAIRMAN WILSON: Any other question?

That is all, Mr. Clare.

(Witness excused)

FRANCIS W. KITTRELL,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. EDELMAN:

Q. Mr. Kittrell, will you please give your full name for the record?

A. My name is Francis W. Kittrell. My address is 4676 Columbia Parkway, Cincinnati, Ohio.

Q. By whom are you employed, Mr. Kittrell?

A. I am employed by the U. S. Public Health Service.

Q. Can you give us the location of that employment?

A. I work at the Robert A. Taft Sanitary Engineering Center of the Public Health Service in Cinatti, Ohio.

Q. How long have you been employed by the Service?

A. I have been employed by the Service between six and seven years.

Q. What is your position?

A. I am in charge of the pollution evaluation unit of the field operation section of the Public Health Service.

Q. Will you tell us generally what the duties of this position entail?

A. Most of my duties involve the study of pollution of streams to determine the effects of wastes on water quality. These studies and reports on such studies are made for several different purposes. In some cases we cooperate with states in special studies that they ask assistance on. A great deal of my work in recent years has been in connection with interstate enforcement.

Q. Prior to this employment did you have any employment experience in fields related to water pollution and water quality?

A. Yes. Previous to coming with the Service I worked for two years with the Atomic Energy Commission in the radioisotopes division and part of my duties in that position was the safe disposal of radioactive isotopes, waste radioactive isotopes, into sewers and into streams. Before that I worked for nine years with the Tennessee Valley Authority in charge of their stream sanitation studies involving studies of not only stream pollution, water quality, but also studies of reservoirs. Previous to that I worked with the Tennessee Department of Health for eleven years in the field of general sanitary engineering, but with major emphasis, again, on stream navigation work. I also had experience there in supervision of public water supplies and of sewage and industrial waste disposal. Previous to that I worked for one year for the North Carolina State Board of Health in their water analysis laboratory.

Q. What is your formal education in sanitary engineering?

A. In sanitary engineering I have a Master's of Science Degree from Harvard University.

Q. In the course of your employment and your experience in your studies did you become familiar with the nature of health hazards presented by sewage pollution of a stream?

A. Yes, I did.

Q. Will you tell us briefly what the nature of that hazard is?

A. Well, the hazard depends on the type of use of water that we are dealing with with respect to municipal water supplies. One of the hazards is that due to contamination by pathogenic organisms which are discharged with sewage. In the event of a plant breakdown or ingestion of the water by humans, without adequate treatment there is a very high degree of probability that some individual will become sick from ingested pathogenic organisms. If we are talking about --

MR. KOENIGSDORF: Excuse me just a minute, please. I am having a little bit of trouble hearing. Will you excuse me?

A. I will try and speak louder, then.

With respect to general recreation or with swimming there is always a chance of direct ingestion of sewage contaminated water, which can lead to illness.

Q. (By Mr. Edelman) Will you tell us briefly how sewage pollution of surface water, such as a stream, is measured and determined?

A. Well, in general there are several different ways, depending on what effect of pollution is being sought. One of the principal methods of measuring the effects of sewage contamination on surface waters is the coliform--a determination of the coliform organism or the coliform bacteria. These coliforms are typical of fecal pollution due to the feces of either humans or animals.

MR. KOENIGSDORF: I am sorry, but I just can't hear very well.

CHAIRMAN WILSON: Just try and speak up, Mr. Kittrell. Remember, talk to the other counsel on the other side of the room.

A. All right.

CHAIRMAN WILSON: And then everyone will be sure to hear you.

MR. SALOME: I myself can't hear very well down here.

A. All right. Well, I will have to speak louder, then.

Would you read back the last statement I made?

(Record read as follows: "These coliforms are typical of fecal pollution due to the feces of either humans or animals.")

A. We take samples of water at selected intervals, selected spots in streams below sources of wastes, over a sufficient period of time to give representative values. These samples are examined for members of the coliform group of bacteria and in some instances for other types of bacteria.

Q. (By Mr. Edelman) Thank you. Now, Mr. Kittrell, in the course of your official duties did you have occasion to familiarize yourself with the Kansas City Metropolitan Area as it related to sewage pollution of the Missouri and Kansas Rivers?

A. Yes, I did.

Q. Did you conduct and direct any study of the Turkey Creek Sewer--

A. Yes.

Q. --with a view to determining the extent of pollution in that sewer?

A. Yes.

Q. Will you tell us when that study or studies were conducted?

A. We sampled the Turkey Creek Sewer on two different occasions, one during the period of December 11 through 17, 1957--I am sorry, that is 11 through 20, 1957, a period of--no, I am sorry, I am still mixed up. May I take all that back?

That was a period of December 7 through 20, 1959. The second period was May 26 through June 1, 1960.

Q. Will you tell us what you did in the earlier survey, that is the one in December of '59?

A. During the survey in December 1959 we established three sampling points on the Turkey Creek Sewer. Two of these were at the mouth of the sewer, one in each of the two barrels of Turkey Creek Sewer where it enters the mouth. The third sampling point was a manhole at the point where the Turkey Creek Sewer flows from Kansas into Missouri.

Q. How big is the sewer, Turkey Creek Sewer, at the point where it crosses the state line?

A. It is about 18 inches in diameter.

Q. What is the size of Turkey Creek Sewer as it goes through the area in Missouri?

A. At the mouth it is a double box sewer, each box being about, according to the information I have, 14 by 17 feet.

Q. The samples that were taken at the state line and at the mouth of the sewer as it emptied into the Kansas River were analyzed and evaluated, were they not, Mr. Kittrell?

A. Yes, we took the samples that we collected during this period into a temporary laboratory established at the Kansas City, Kansas, water plant and made certain laboratory determinations on them.

May I go back and correct? I have gotten dates mixed up, I am sorry to say. I was thinking about Kansas River studies when I gave you the dates on the Turkey Creek studies. These were the 14th through the--

CHAIRMAN WILSON: Mr. Kittrell, some of the Board members are still having difficulty hearing you.

A. Might I move out a little closer to them? Would that be possible?

CHAIRMAN WILSON: Try to remember my suggestion--

MR. EDELMAN: Just speak up.

CHAIRMAN WILSON: --make those gentlemen on the opposite side of the room hear you, then everybody can hear you.

MR. EDELMAN: You might talk to Mr. Salome, the member of the Board at the opposite end there.

A. I would like to correct the date of the sampling of the Turkey Creek Sewer. It was during the period December 11 through the 17th, 1959.

Q. (By Mr. Edelman) Did this analysis--

MR. KOENIGSDORF: Was that one time or two times?

A. That was the first period, December 11 through the 17th was one period. The second period was May 26 through June 1, 1960.

Q. (By Mr. Edelman) Mr. Kittrell, will you tell us what the result of this analysis and evaluation of the samples revealed with respect to the strength of this sewage?

A. Yes. The samples-- I might add that we did have gauging of the sewer near the mouth which was performed by the U. S. Geological Survey. By combining the results of the laboratory analyses in milligrams per liter for BOD and suspended solids with the flow we derived figures for the pounds per day of BOD and of suspended solids discharged from the mouth of the Turkey Creek Sewer. The totals of these values for both boxes at the mouth of the sewer were 34,952 pounds per day of five-day BOD and were 39,986 pounds per day of suspended solids. In terms of population equivalents the BOD population equivalent would be 206,000 and the suspended solids total population equivalent would be 199,900.

Q. Are you able to determine what proportion of these values is attributable to sewage originating in Kansas and sewage originating in Missouri?

A. By use of the data that we collected from the manhole where this sewer crosses the state line from Kansas into Missouri, I compute that the Kansas portion of this total that I have just quoted was 1,400 pounds per day of BOD and 1,830 pounds per day of suspended solids. These are equivalent to population equivalents for BOD of 8,250 and for suspended solids 9,150. The BOD P.E. figures represent four percent of the total from Turkey Creek Sewer, the suspended solids figures 4.o percent of the suspended solids population equivalent from the sewer.

Q. What is the Missouri contribution, Mr. Kittrell?

A. Well, the Missouri contribution alone would be 33,552 pounds per day of BOD or a population equivalent of 197,750. The suspended solids contribution from Missouri would be 38,156 or a population equivalent of 190,780.

Q. Did you determine the relative bacterial contamination contributed by the Missouri and Kansas communities to this sewer?

A. Yes. During the second period that we sampled we collected, again, samples for five days near the mouth of the river--I mean near the mouth of Turkey Creek, at the mouth of Turkey Creek, and made determinations for coliform organisms. We collected samples at two-hour intervals throughout the daylight hours of each day for each of the five days.

Q. That was during the period May 26 to June 1, 1960.

A. That is correct.

Q. What values did you obtain for coliform?

A. For the north barrel the average coliform content of the samples that we took was 33,510,000 per hundred milliliters. On the south barrel the arithmetic average of the values that we obtained was 51,510,000 per hundred milliliters.

Q. What was the level of the coliform in the Kansas River immediately above the sewer? Did you determine that at the same time?

A. Yes, we collected a single sample daily from the bridge just above Turkey Creek Sewer and on those five samples the average of the coliform bacteria was 157,000 per hundred milliliters.

Q. Mr. Kittrell, what does the level of coliform that you found in the mouth of Turkey Creek Sewer indicate is the nature of its discharge?

A. It indicates that the discharge from Turkey Creek Sewer has a very high proportion of sanitary or domestic sewage.

Q. Did you make a study of the Kansas River in the Kansas City Metropolitan Area?

A. Yes, we did.

Q. When was that study made?

A. That study was made during the period November 1 through 7, 1959, a period of seven days.

Q. This was a study of the Kansas River, wasn't it?

A. That is correct.

Q. Can you tell us in general what you did to arrange for that study?

A. We selected sampling points at four different points on the river above the Kansas City Metropolitan Area and within the Kansas City Metropolitan Area. We collected samples from these stations three times each day and sampling points at each station were located at the one-third point, which means that each time we sampled at a station we got two samples at two points across the river. We sampled each station three times per day, early morning, about the middle of the day, and later afternoon. And we did this for seven days at all stations.

On these samples we determined, again, coliform bacteria and BOD and dissolved oxygen.

Q. Did you prepare a chart showing the location of these sampling stations on the Kansas River?

A. Yes, I did.

Q. Do you have it here?

A. Yes.

Q. Is that the chart?

A. This is the chart.

MR. EDELMAN: I ask that the chart labeled "Kansas River in the Kansas City Metropolitan Area, Sources of Organic Wastes" be marked for identification as Government Exhibit No. 49.

(Government's Exhibit No. 49 marked for identification.)

Q. (By Mr. Edelman) Directing your attention to Government Exhibit for identification No. 49, Mr. Kittrell, I ask you whether the Kansas River and the Missouri River as depicted on that chart constitute, in your opinion, a fair representation of these streams in the Kansas City Metropolitan Area?

A. Yes, they do.

Q. Will you indicate with reference to that exhibit the location of the sampling stations you established for your November survey of the Kansas River?

A. Yes. The farthest upstream station was located at Bonner Springs, Kansas. Our sampling point was a distance of 19.1 miles above the mouth of the Kansas River.

The next station was located at the Turner Bridge, Turner, Kansas, bridge,a distance of 9.1 miles above the mouth of the river. This station was above all significant discharges of wastes into the Kansas River from the Kansas City Metropolitan Area.

The next station was located just above the point of entrance of the Turkey Creek Sewer at a distance of 3.1 miles above the mouth of the Kansas River.

The final station was located near the mouth of the river about three-tenths of a mile upstream from the mouth and below all significant sources of waste discharged from the Kansas City Metropolitan Area. This station was just above the Intercity Viaduct.

Q. Did you as part of this study, Mr. Kittrell, determine the relative contribution of organic wastes into the Kansas River and the Missouri side and the Kansas side?

A. Yes.

Q. Will you please tell us what this determination was?

A. Well, we made this determination on the basis of three different items. One was on the basis of equivalent sewered population, one on the basis of equivalent sewered population, one on the basis of the BOD population equivalent, and one on the basis of suspended solids population equivalent.

Q. I direct your attention to Government Exhibit No. 49 for identification and ask you whether that chart shows the relative contribution of organic wastes from the two states to the Kansas River?

A. In terms of the BOD population equivalent, yes.

Q. Will you please describe that and tell us what it signifies?

CHAIRMAN WILSON: Just a moment, counsel. Before he proceeds to testify with reference to the data shown on the chart, I suggest that you offer that exhibit in evidence and permit objections, if there are any.

MR. EDELMAN: Thank you, Mr. Chairman.

I offer Government Exhibit No. 49 in evidence as Exhibit 49.

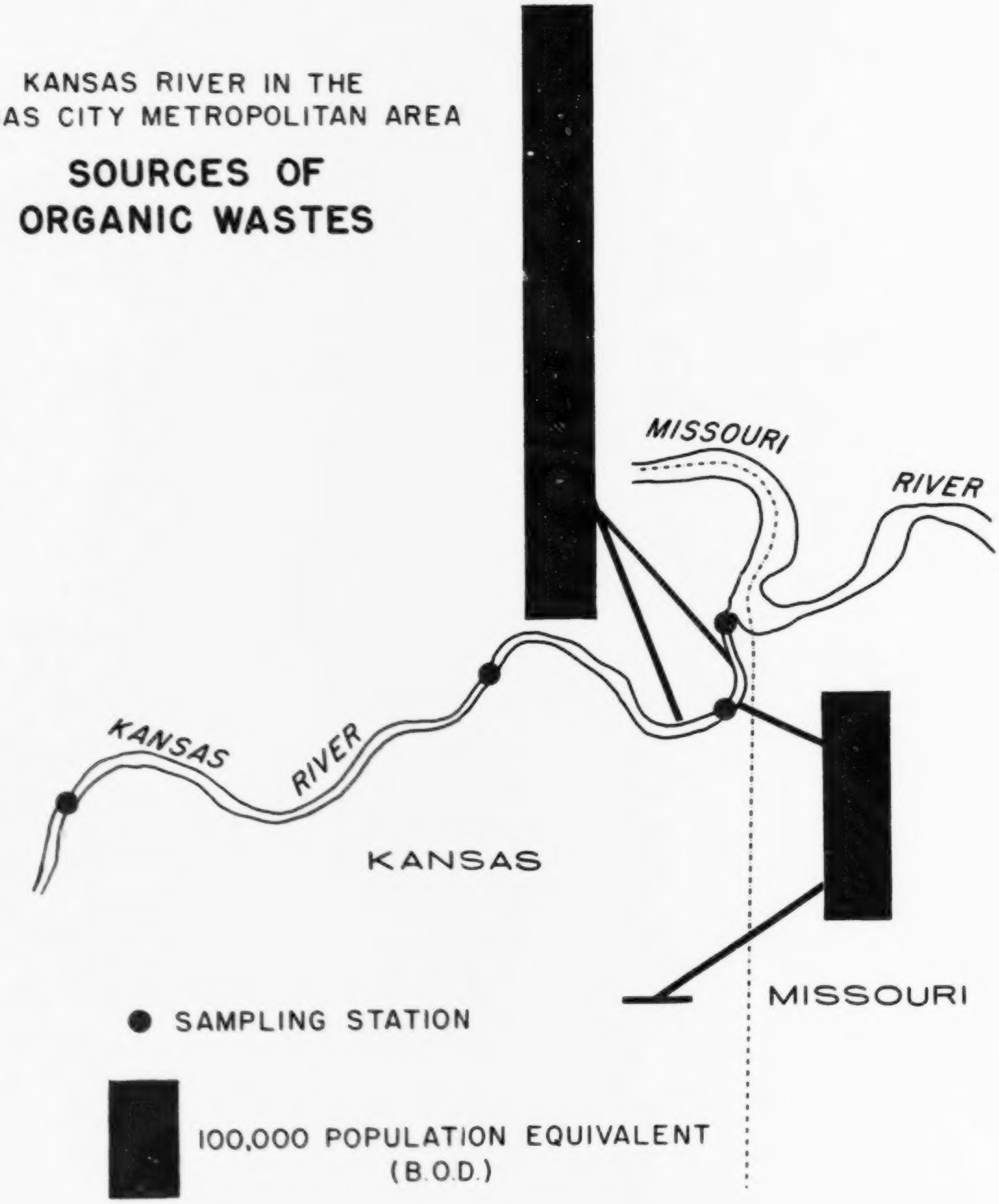
CHAIRMAN WILSON: Any objection?

Hearing none, it will be received.

(Government's Exhibit No. 49 received in evidence.)

KANSAS RIVER IN THE
KANSAS CITY METROPOLITAN AREA

SOURCES OF ORGANIC WASTES



Q. (By Mr. Edelman) Will you proceed, Mr. Kittrell, and tell us what those markings on the chart indicate?

A. The relative contributions of organic matter in terms of BOD population equivalent from the two states into the Kansas River are shown on the green bars. In the lower left-hand corner of the chart we have a bar, the height of which indicates 100,000 population equivalent. The bar at the top of the chart represents the BOD population equivalent of waste discharged from Kansas into the Kansas River. These wastes total a population equivalent of-- Oh, I might go back a minute and add that also this small bar near the bottom of the chart indicates that portion of the Kansas wastes which flow into the Turkey Creek Sewer and through the Turkey Creek Sewer to the Kansas River. The total of these two bars represents a population equivalent of 543,600 from Kansas.

The bar to the right of the chart represents the wastes from Missouri, for a total of 179,800 population equivalent.

CHAIRMAN WILSON: How many was that, Mr. Kittrell?

A. 179,800. From the two states combined we have a total of 741,400 population equivalent, of which the Missouri wastes represent 26.7 percent, the Kansas wastes 73.3 percent.

Q. (By Mr. Edelman) Did you determine the suspended solids in this area?

A. Yes.

Q. Do you have a chart reflecting that?

A. Yes.

MR. EDELMAN: I ask that this chart which bears the legend "Sources of Suspended Solids" be marked in identification as Government Exhibit No. 50.

(Government's Exhibit No. 50 marked for identification.)

Q. (By Mr. Edelman) Mr. Kittrell, this chart purports to show the Kansas River and the Missouri River and bears some other markings. Is this representation of the Kansas River-Missouri River a fair representation of those streams, according to your knowledge?

A. Yes.

Q. Were those markings placed on there by you or under your direction?

A. Under my supervision, yes.

Q. Under your supervision.

MR. EDELMAN: I offer this exhibit as Government Exhibit in evidence No. 50.

CHAIRMAN WILSON: Any objection?

Hearing none, it will be received.

(Government's Exhibit No. 50 received in evidence.)

Q. (By Mr. Edelman) Directing your attention to Government Exhibit No. 50, I ask that you tell us what those lines represent?

A. These are similar--this is a similar representation to the previous chart, Government Exhibit 49, but this gives population equivalent in terms of suspended solids. Here again the bar in the lower left-hand corner represents 100,000 population equivalent based on suspended solids. The bar at the top of the chart, plus the small bar at the bottom of the chart, combined represent the wastes from Kansas which are discharged into the river. These have a total of 576,700 population equivalent. The bar to the right of the chart represents the waste discharged from Missouri into the Kansas River, for a total of 190,800 population equivalent. The total from both states is 758,500, of which 25.2 percent come from the Missouri and 74.8 percent from Kansas.

Q. As a result of the analysis and sampling of the Kansas River that you have described, did you make any determinations as to the level of bacterial contamination in that river?

A. Yes, I did.

Q. Have you prepared a chart reflecting your determinations on this subject?

A. We have a chart showing the equivalent sewered population of waste discharged to the river from the two states.

Q. Sources of bacterial contamination?

A. That is right.

MR. EDELMAN: May we have that chart?

(Government's Exhibit No. 51 marked for identification.)

Q. (By Mr. Edelman) The chart "Sources of Bacterial Contamination" which has been marked Government Exhibit No. 51 reflects what, Mr. Kittrell?

A. This is a similar chart to the previous two, but in this case based on the sewered population equivalent. I have called this "Sources of Bacterial Contamination".

MR. EDELMAN: I ask that this be admitted to evidence as Government Exhibit No. 51.

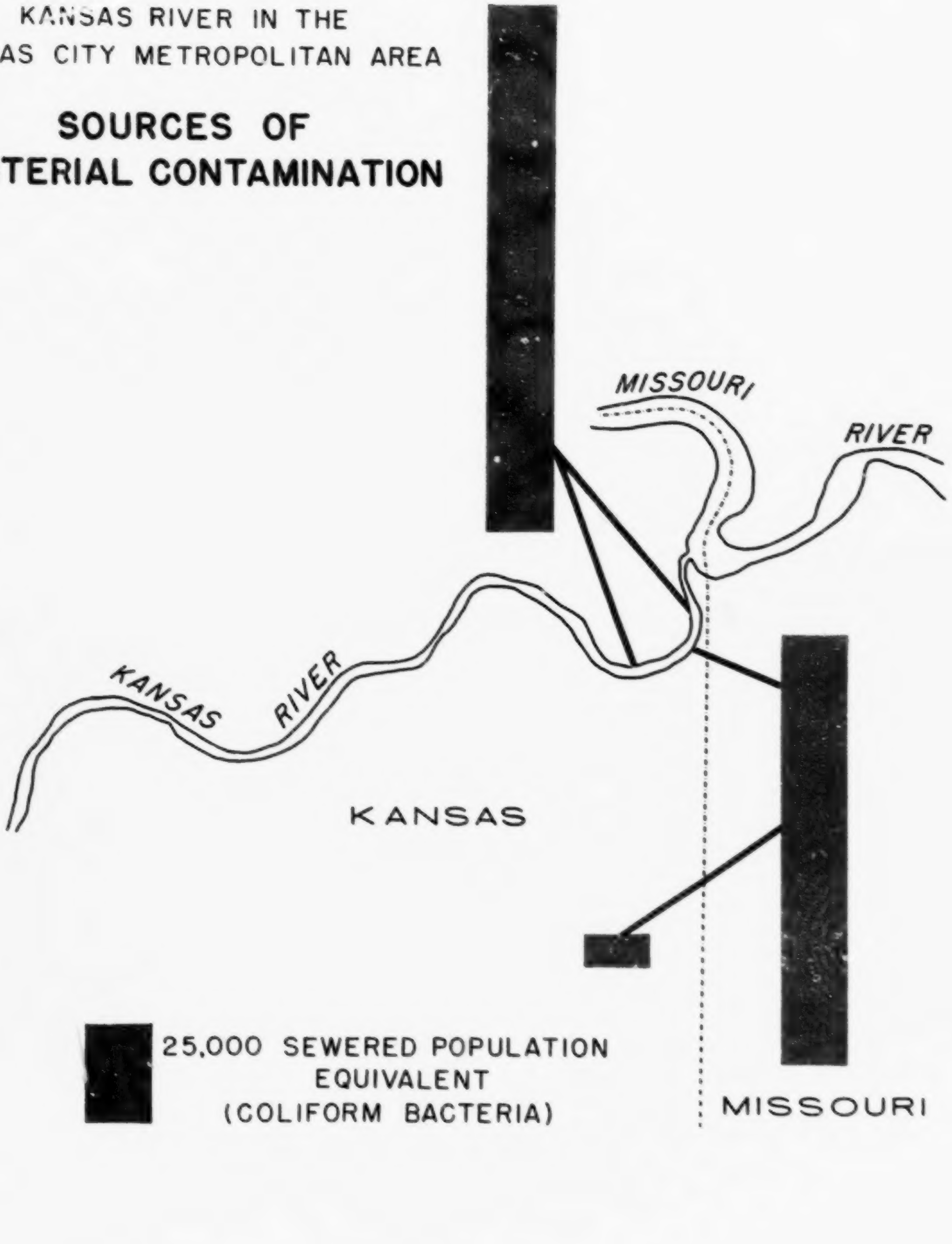
CHAIRMAN WILSON: Any objection?

Received.

(Government Exhibit No. 51 received in evidence.)

KANSAS RIVER IN THE
KANSAS CITY METROPOLITAN AREA

SOURCES OF BACTERIAL CONTAMINATION



A. The bar in the lower left-hand corner in this case represents the equivalent of a sewered population of 25,000. The bar at the top of the chart plus the small bar near the bottom of the chart represent the equivalent sewered population of waste discharged to the Kansas River from Kansas. The total of these is 143,200. I should explain here that this is not strictly sewered population. This makes an allowance for the bacterial contamination contributed by the packing house wastes. In that figure I have a figure of 50,000 sewered population equivalent for the bacterial contamination contributed by the packing house wastes.

The bar at the right-hand side of the chart represents the sewered population discharging wastes into the Kansas River from Missouri for a total of 110,000. The two states combined discharge a total of 253,200 sewered population, of which 43.4 percent originate in Missouri and 56.6 percent in Kansas.

Q. (By Mr. Edelman) Referring to Government Exhibit No. 49--

MR. EDELMAN: May we have that?

Q. (By Mr. Edelman) Will you tell us, Mr. Kittrell, what your analysis of samples taken at the sampling stations you indicated, as were established on Government Exhibit No. 49, revealed with respect to the level of bacterial contamination?

A. Yes. And I have a chart to show this, incidentally.

MR. EDELMAN: Well, may we have that chart, then.

I ask that this be marked for identification as Government Exhibit No. 52. The title is "Bacterial Contamination of Kansas River-November 1959."

(Government's Exhibit No. 52 marked for identification.)

Q. (By Mr. Edelman) Will you describe Government Exhibit No. 52 for identification, Mr. Kittrell?

A. This is a chart representing the average coliform bacteria values found at the four sampling stations that we established on the Kansas River, the average for a period of one week of sampling. At the bottom of the chart appears a set of numbers showing the distance of each station above the mouth of the river in miles, reading from right to left. The figures at the side of the chart, the left-hand side of the chart, show the coliform bacteria in thousands, the coliform bacteria per hundred milliliters in thousands. In other words, where we have the figure of 100 at this point on the left edge of the chart, that means 100,000 coliform bacteria per hundred milliliters.

Q. The bars that are on there represent a visual presentation of the statistical findings that you made, Mr. Kittrell?

A. That is correct. The height of the bar in each case indicates the average coliform bacterial numbers that we found.

MR. EDELMAN: We offer Government Exhibit No. 52 into evidence.

CHAIRMAN WILSON: Any objection?

Received.

(Government's Exhibit No. 52 received in evidence.)

Q. (By Mr. Edelman) Will you tell us what your statistical findings were, using Government Exhibit No. 52?

A. At Bonner Springs we found an average coliform bacteria mpn of 119,600.

At Turner Bridge, above all sources of wastes from the Kansas Cities Metropolitan Area, we found an average mpn of 121,500.

Just above the Turkey Creek Sewer we found an average of 123,900.

And near the mouth of the Kansas River, below all sources of wastes from the Kansas Cities Metropolitan Area, we found a total of 223,200.

Q. What proportion of that final figure, Mr. Kittrell, or what amount of that final figure do you attribute to discharge from Turkey Creek Sewer?

A. We have a total increase from the sampling station at Turner Bridge to the station at the mouth of the river which brackets all of the wastes discharged to the river in the Kansas Cities Metropolitan Area, we have an increase in that stretch of the river of 107,700 coliform bacteria per hundred milliliters. Of this, I have computed that 43.4 percent of this increase, which represents the proportion of this equivalent sewered population which comes from Missouri, I figured that 44,000 of that increase comes from the Turkey Creek Sewer.

Q. That 44,000 figure, is that the Missouri contribution to Turkey Creek Sewer or the total contribution of both Kansas and Missouri?

A. That is the contribution from Missouri, all of which, according to my records, come through Turkey Creek Sewer.

Q. Mr. Kittrell, I direct your attention to Government Exhibit No. 19 and request that you indicate where your sampling station that you described as being near the Intercity Viaduct is placed--18, excuse me. Government Exhibit 18.

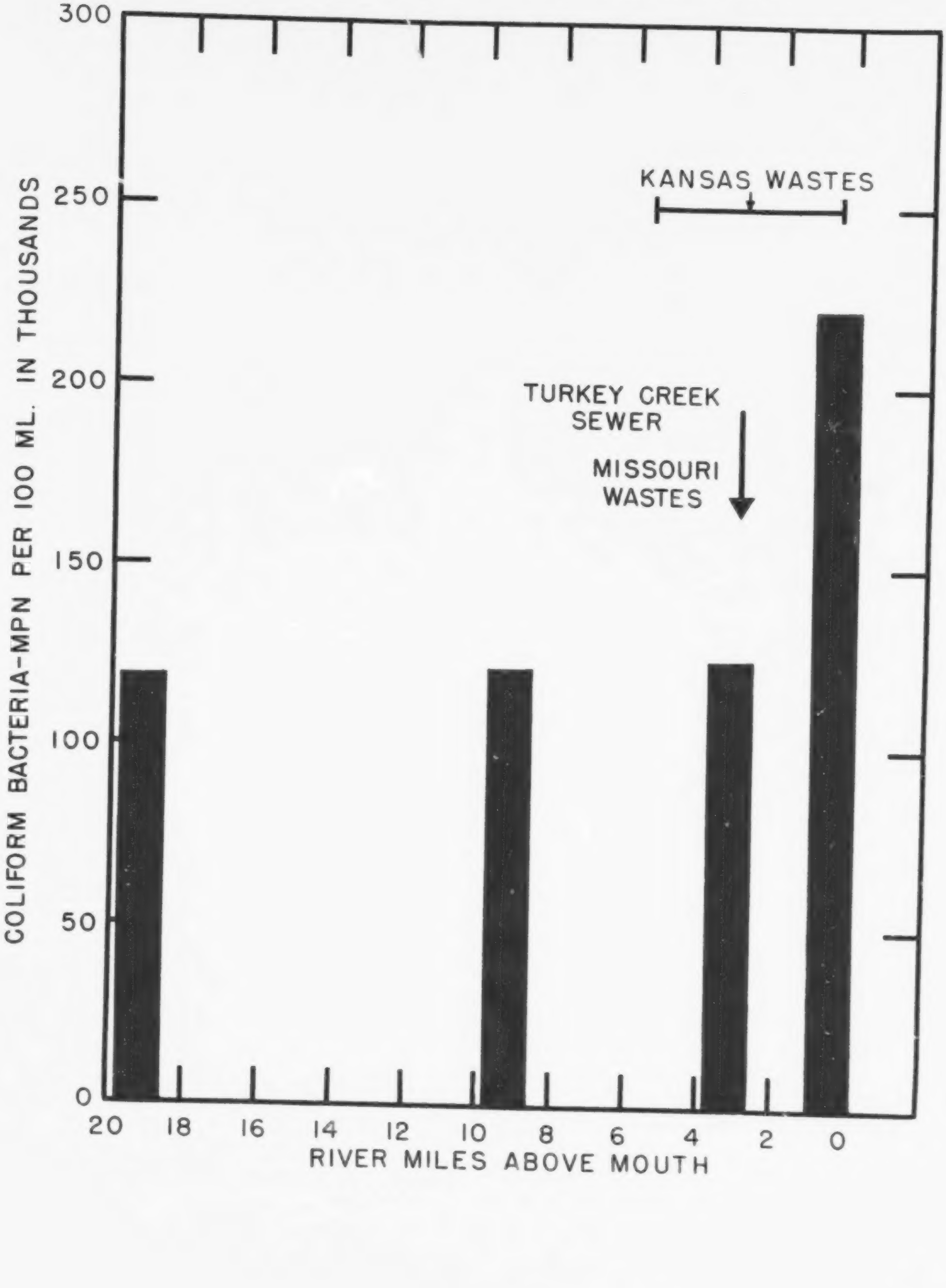
A. That was at this point just above the Intercity Viaduct, stationed at mile 0.3.

Q. I direct your attention to the confluence of the Missouri and the Kansas which is immediately to the north of that viaduct.

A. (Indicating)

KANSAS RIVER IN THE KANSAS CITY
METROPOLITAN AREA

BACTERIAL CONTAMINATION OF KANSAS RIVER-NOV. 1959



Q. And ask you whether pollution discharged into the Kansas River and from Turkey Creek Sewer into the Kansas River will reach that part of the Missouri River which is in Kansas?

A. You mean this portion along here (indicating)?

Q. That is right.

A. Yes.

Q. Will it reach it in substantial amounts, Mr. Kittrell?

A. Yes, it will.

Q. Do you consider that the Kansas River is a safe water for recreational sports in which people come in direct contact with raw water?

A. No, I do not.

Q. Do you consider that the level of pollution indicated by your studies indicates that a potential health hazard exists there?

A. Very definitely.

Q. Do you consider that this hazard is affected by the discharge from Turkey Creek Sewer?

A. Yes, that contributes its proportionate share to the total contamination.

Q. In what respect is the hazard affected? Is it increased or decreased?

A. You mean by Turkey Creek Sewer?

Q. Yes.

A. Yes, it is increased by the discharge of sewage from Turkey Creek Sewer.

Q. Do you consider that the pollution of the Kansas River which you have described which reaches the Missouri River in the area of the confluence of the Kansas and Missouri constitutes a potential health hazard to people who use that area of the Missouri River?

A. Yes.

Q. Mr. Kittrell, yesterday Mr. Pafford of the Corps of Engineers testified with respect to possible low flows of the Kansas River. I now inquire whether you have computed the bacterial contamination or concentration that would exist at the low flows he described?

A. Yes, I have computed, based on this increase that I referred to between the Turner Bridge and the mouth of the sewer, that at 1,000 cubic feet per second of flow, which was mentioned by Mr. Pafford, that increase due to the smaller dilution would be 438,000. At between 700 and 800 cubic feet per second, which Mr. Pafford mentioned, I have used 750 as an average, that increase would be 578,000 per hundred milliliters. And at the minimum flow which Mr. Pafford mentioned of 160 cubic feet per second, that increase could be 2,400,000 per hundred milliliters.

Q. Would this increase in the concentration of coliform organisms enhance or otherwise affect the potential health hazard, Mr. Kittrell?

A. It would make it worse?

Q. Why?

A. Because the higher the number of coliform bacteria present as coming from a source of sewage the higher is the probability that there will be pathogenic organisms present also, the higher the numbers of pathogenic organisms the greater the probability of anyone coming in contact with the water or the greater the probability that anyone coming in contact with the water will ingest some of the pathogenic organisms and contract disease from this.

Q. Mr. Kittrell, would flows of the low water you have described have any effect on the biochemical oxygen demand of the wastes discharged to the river?

A. Yes, on the BOD values that we got at these same stations we had an increase, again from Turner Bridge to the station at the mouth of the river, an increase in BOD of from 2.67 parts per million at Turner Bridge to 5.08 parts per million at the mouth of the Kansas River. This was an increase of 2.41 parts per million, a five-day BOD, at the flow of the river during the period that we were sampling. This flow was 4,410 cfs.

At the lower flow of 1,000 cfs I have computed that this BOD increase could be 10.3 parts per million, at a flow of 750 cfs this could be 24.4 parts per million; and at 160 cfs this could be as much as 100 parts per million increase in BOD in this section.

Q. What effect would that have on any living organism such as fish in the river?

A. At the lower flows, the BOD's in the vicinity of 24 to 100 which might occur at the two lower flows mentioned,there is little doubt that dissolved oxygen would be totally depleted. If this occurred suddenly, it could kill fish caught in that area. If it didn't occur suddenly enough to kill fish, it would certainly block the passage of fish from the Missouri River into the Kansas or from the Kansas back into the Missouri, it would block the passage of fish in both directions.

Q. Mr. Kittrell, yesterday Mr. Pafford of the Corps of Engineers, As I recall, testified that at certain seasons of the year a rise in the water level of the Missouri prevented the Kansas from flowing into it so that the water remained more or less in one place in the Kansas River.

A. That is right.

Q. What effect would that have on the pollution that you have described as existing near the mouth of the Kansas River?

A. Well, if that persisted for any length of time it could make both the coliform concentrations and the BOD concentrations much higher than any of the values that I have computed, because you would have very small dilution of the wastes discharged to the river under those circumstances and very high levels of both coliform organisms and BOD could build up under such conditions in the river.

Q. Would that condition, if it persisted, be characterized as a septic condition or something like that, Mr. Kittrell?

A. It undoubtedly would become septic in those areas where the wastes are discharged.

CHAIRMAN WILSON: Counsel, if you have reached a stopping point in the testimony, I think we will take our afternoon recess for fifteen minutes.

(RECESS)

CHAIRMAN WILSON: The hearing will come to order.

Go ahead, Mr. Stein.

MR. STEIN: Mr. Chairman,Mr. Kittrell is at a convenient breaking point in his testimony, having testified as to pollution in the Kansas River. The remainder of his testimony will largely relate to pollution in the Missouri River.

We do have a government witness, Dr. Kabler, who has commitments elsewhere in the country tomorros. We would like to seek permission to put Dr. Kabler on the stand now and take his testimony and resume with Mr. Kittrell at the conclusion of Dr. Kabler's testimony, if we might.

CHAIRMAN WILSON: You may do so.

MR. STEIN: Thank you.

Dr. Kabler.

PAUL W. KABLER,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. EDELMAN:

Q. Dr. Kabler, will you give your full name, please?

A. Paul W. Kabler.

Q. Dr. Kabler, by whom are you employed?

A. United States Public Health Service.

Q. How long have you been employed by the Service?

A. About eleven years.

Q. What position do you hold?

A. I am Chief of Microbiology in the water pollution program staff--or Robert A. Taft Sanitary Engineering Center.

Q. That is in Cincinnati, Ohio?

A. Cincinnati.

Q. What in general are your duties in your position?

A. In general, to supervise and administer the research program in microbiology, water pollution. This includes bacteriology, mycology, and virology.

Q. What formal degrees do you hold?

A. I hold an A.B. in Chemistry, a Master's and a Ph.D. in Bacteriology, a Doctor of Medicine and a Master of Public Health.

Q. Dr. Kabler, in the course of your official duties did you direct studies of special indicator organisms relating to pollution originating in the Kansas Cities Metropolitan Area?

A. I did.

Q. Can you tell us when that study took place, just the month and year?

A. October 1959.

Q. Can you tell us in detail what the elements of that special study were?

A. This was a study to determine the fecal coliform organisms which are a portion of the coliform organisms that have been mentioned by Mr. Kittrell. The water samples were filtered through a membrane filter, placed on a preservation media, and forwarded to the Taft Sanitary Engineering Center where the tests were completed. The fecal coliform determination was determined by picking sheen colonies from the membrane filter into liquid fermentation tubes and those tubes that produced gas are considered fecal coliforms.

Q. What special elements characterize fecal coliforms, Dr. Kabler? Do they indicate any special source?

A. As indicated by the name of these organisms, they came from fecal source, either humans or animals, warm-blooded animals.

Q. Are fecal coliforms generally considered to be harmful or pathogenic?

A. In general they are used as indicator organisms of fecal pollution, but there are a small number of them that are known as pathogenic coli which cause enteric disease, especially among infants and children.

Q. Do the fecal coliform organisms indicate the potential presence of other pathogenic organisms when associated with recent sewage discharges?

A. They do.

Q. Can you tell us what some of these other pathogenic organisms are?

A. Well, in this country they might be the organism of typhoid fever, bacillary dysentery, any one of a large number of the Salmonella organisms, polio virus, infectious hepatitis virus.

Q. Are there any less serious diseases that are also associated with these coliforms?

A. The more nondescript gastroenteritis upsets, which are frequently caused by Salmonella or sometimes by the bacillary dysentery, is the most frequent and one I didn't mention before.

Q. Turning to the special study that you testified was made in October, can you tell us at what period samples were collected and at what points in the river?

A. Yes. The samples were collected in an effort to follow a particular portion of the water downstream. One sample was collected at 1 a.m. on October 24 at Kansas City, Kansas; the second sample was collected at 7 p.m., October 27, Lexington, Missouri; third sample at 10 p.m. on October 26 at Jefferson City; and the last sample at 4 a.m. on October 28 at Howard Bend, Missouri.

Q. Could you give me the date of the collection of the sample at Lexington, Dr. Kabler?

A. October 26--no, excuse me--October 24.

Q. These samples were analyzed in the laboratory according to the procedure you have described earlier, were they not?

A. They were, yes.

Q. And you reached certain determinations with respect to these samples?

A. Yes.

Q. Did you prepare a chart which visually records your statistical determination?

A. I did.

Q. May I have that?

MR. EDELMAN: I ask that this be marked as Government Exhibit for identification No. 53.

(Government's Exhibit No. 53
marked for identification.)

MR. EDELMAN: This chart is entitled "Fecal Coliform Densities in Missouri River by MF Tests - October 24 to October 28, 1959." I have extra copies which are being distributed to counsel and for the Board.

Q. (By Mr. Edelman) Referring to Government Exhibit No. 53 for identification, Dr. Kabler, will you briefly describe this chart?

A. Well, this chart shows that at Kansas City, Kansas, on October--

CHAIRMAN WILSON: Just a minute, Doctor, before you tell what the chart shows, just indicate generally the type of data that are on the chart so it may be offered in evidence and counsel will have an opportunity to object or cross-examine if they wish.

A. Chart No. 53 shows the concentrations of fecal coliform organisms at the four stations mentioned on the Missouri River.

Q. (By Mr. Edelman) The bottom of the chart represents river miles, Dr. Kabler?

A. It does, yes.

Q. And the line running vertically on the left-hand side of this chart represents, as I read it, the fecal coliform density for hundred milliliters river water, is that correct?

A. MPN of fecal coliform per hundred ML.

MR. EDELMAN: I offer this exhibit in evidence as Government Exhibit No. 53.

CHAIRMAN WILSON: Any objection?

Hearing none, it will be received.

(Government's Exhibit No. 53 received in evidence.)

Q. (By Mr. Edelman) Will you tell us, Dr. Kabler, what your statistical findings were with reference, and refer to, Exhibit No. 53?

A. This shows that on October 24 there were 24,000 fecal coliform organisms found per hundred milliliters in the water of the Missouri River at Kansas City, Kansas. It shows that following this method of sampling used that at Lexington, Missouri, at six hours later the same day there were 73,600 fecal coliform organisms per hundred milliliter of water. Something less than two days later, on October 26, at Jefferson City, Missouri, there were still 33,000 fecal coliform organisms per hundred milliliters of water; and two days later at Howard Bend, Missouri, there were 9,800 fecal coliform organisms per hundred milliliters of water.

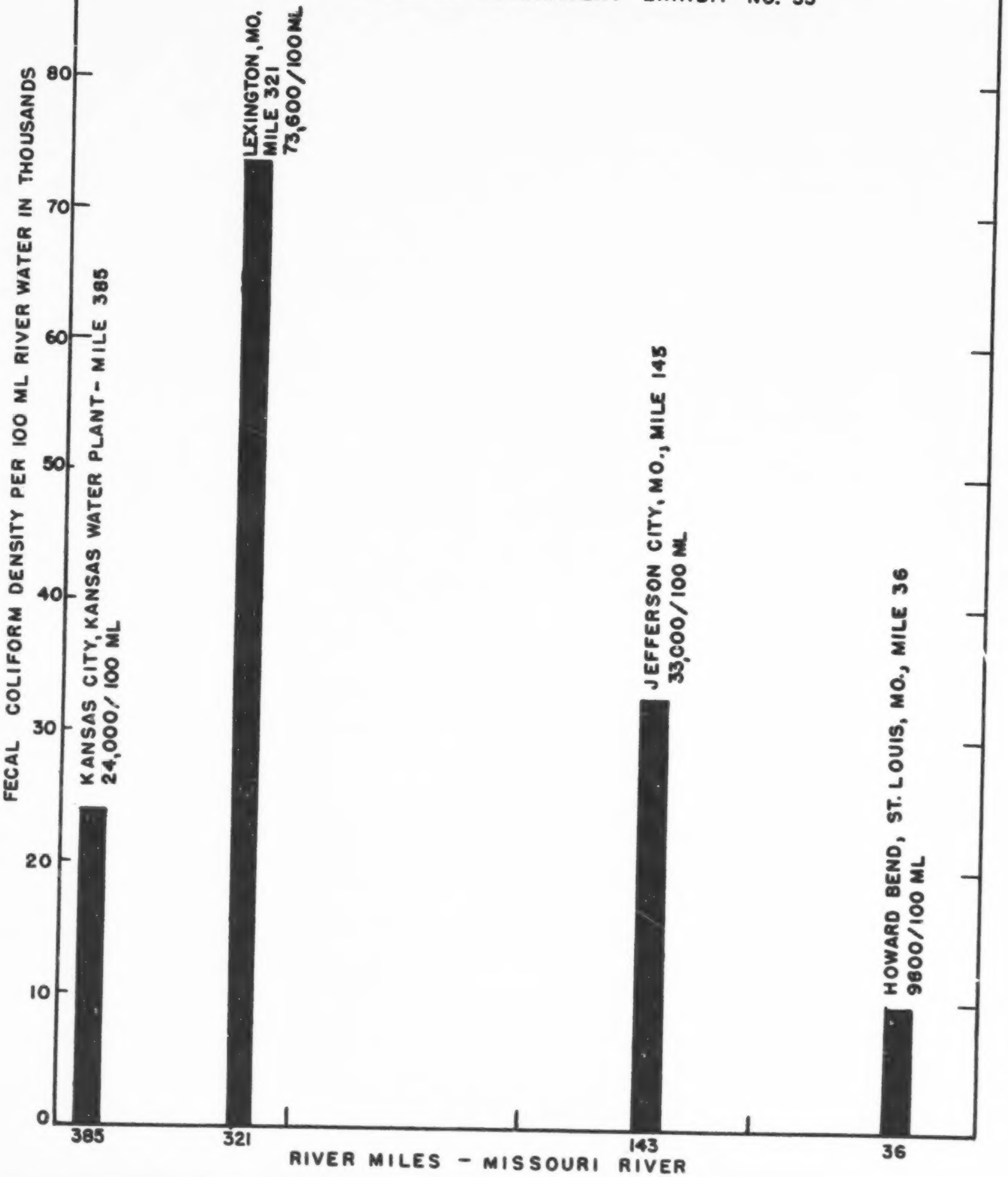
Q. Dr. Kabler, do you have any opinion as to the source of this increase in fecal coliform that is reflected below Kansas City?

FECAL COLIFORM DENSITIES IN MISSOURI RIVER BY MF TESTS

SAMPLE COLLECTION TIMED TO BE APPROXIMATELY EQUAL TO FLOW RATE
OCTOBER 24, 1:00 AM TO OCTOBER 28, 4:00 AM, 1959

PREPARED UNDER PERSONAL SUPERVISION OF PAUL KABLER, JUNE 2, 1960

BASED ON GOVERNMENT EXHIBIT NO. 53



A. Yes. It would be my opinion that the increase in fecal coliform organisms here came from the pollution gained by the river between the sampling station above Kansas City, Kansas, and Lexington, Missouri.

Q. The sampling station above Kansas City, Kansas, was that at the Kansas City Water Plant?

A. Yes, sir.

Q. Do you have any opinion, Dr. Kabler, as to the proportionate contribution made by sewage originating in Kansas City, Kansas, and originating in Kansas City, Missouri, to this increase in fecal coliforms?

A. Yes. I believe that the proportionate contribution would roughly correspond to the populations of the two areas, which I understand are about one to four, that is about one-fifth would come from Kansas City, Kansas, and four-fifths from Kansas City, Missouri.

Q. Do you consider that the level of pollution that you have just described as represented by these concentrations of fecal coliform represents a potential health hazard to persons using this stretch of the Missouri River for water sports during which they come into direct contact with raw water?

A. I believe it would.

Q. Do you consider that present methods of water treatment which are followed in this part of the country, which consist of settling, chlorination, filtration, furnish a positive guarantee that no pathogenic organisms will pass through the treatment plant and into the finished water?

A. No, I don't believe we could give a complete guarantee that it would. It would certainly materially reduce it.

Q. Would you consider that if the sewage pollution which enters the Missouri River in the Kansas Cities Metropolitan Area were substantially reduced that it would affect the level of the potential health hazard that exists in this stretch of the Missouri River?

A. I believe it would reduce the potential health hazard.

Q. Dr. Kabler, can you tell us how many miles are involved between the station at the Kansas City Water Plant and the last point on your chart? As I read it, that is 36 miles. Is that 36 miles above the mouth of the Missouri River?

A. That is right. It would be 349 miles, wouldn't it?

MR. EDELMAN: That is close enough for me.

We have no further questions, Mr. Chairman.

CHAIRMAN WILSON: Cross-examination? Counsel for the city.

CROSS-EXAMINATION

BY MR. KOENIGSDORF:

Q. Dr. Kabler, have you ever heard or do you know of any case where anyone ever became ill by reason of drinking water from the Kansas River or the Missouri River in the area you indicate?

A. In the Missouri River in the area indicated?

Q. I restrict the question to the Kansas River. Did you make a study of the Kansas River?

A. As far as I know, there are no reported cases from that restricted area.

Q. Is there any case arising out of boating, swimming, fishing or eating fish in connection with that area that you know of?

A. Not this particular area.

Q. Now, Doctor, you testified, if I understood you correctly, that water treatment furnished would not guarantee that pathogens would not enter into the water source or, rather, into the water. There is no known water treatment that will take all those things out, is there?

A. Are you speaking in ultimate complete things again, in positivities?

Q. I am speaking of water treatment plants as we know them. Is there any plant that can remove all pathogens from the water source?

A. It can remove them below the measurable level.

Q. And water treatment with a settling basin is not different than primary sewage treatment as far as settlement is concerned, is it? You are just adding the process at the beginning of your water treatment that you would have when the sewage goes into the river, is that correct or not?

A. You are speaking of the--

Q. When water goes into the river and you treat it, that is sewage treatment. When it is taken out for water source and it receives primary settling, that is the same treatment as it would receive or better than the primary sewage treatment, is that correct or not?

A. Well, there should be considerable difference in the quality of the material that you are seeking to settle, a difference in the material in suspension. It would seem that they were both settlements.

Q. Your water treatment actually is better because you have more of a solution, is that correct or not? You have more water and, therefore, it is a greater percentage of water in your water that is treated when it gets to your intake, is that right or wrong?

A. I would suppose that that is probably incorrect, but I would rather you would get this type of testimony from the engineers on the physical phenomena.

Q. I don't know if the engineers would know about removing these things or not.

A. What are you talking about?

Q. I mean when you treat the water when it goes into a water intake does it remove the solids and other items you are talking about the same as settling basins or primary treatment when it goes through sewage treatment, only better?

A. The possibly difference is in the size and consistency of the materials that you wish to settle. This makes a considerable difference. From your description I don't know as you have said that they are identical. Or are they the same? Are we talking about the same thing? It doesn't strike me that we are.

Q. Well, I guess I haven't made myself clear in my language. It is about as clear as I can do. When you have water treatment or sewage treatment it amounts to settling, does it not, as the primary treatment it is settling?

A. This is part of it, yes.

Q. When you come back and take the water into a water supply through a water treatment plant you do the same thing, only your water is probably less filled with these solids, and so forth, than it would be when it came directly out for sewage treatment because it has been commingled with the river?

A. Well, I think this is sometimes true, but not necessarily so.

Q. Well, why is it not necessarily true?

A. Because of suspended silts and other materials from runoff.

Q. Sir, I didn't get the last.

A. Because of other suspended materials, non-sewage materials.

Q. Are those other suspended materials damaging and injurious to public health or of individuals?

A. In respect to causing disease, I don't know as they are. They contribute to the color and turbidity and acceptability of the water.

Q. You will have to help me a little bit because I think you probably know about it. It is Chanute, Kansas, that recirculated its water ten or more times during a drought years ago?

A. I believe it was, yes.

Q. And at the end--that was, they recirculated their sewage back and used it for drinking water because they were short in supply and at the last time it was used,it still passed the department standards for drinking water, is that correct or not?

A. In part that is correct.

Q. Was there any illness that arose, to your knowledge, to the inhabitants of Chanute using that water?

A. As far as I know there were no reported illnesses.

Q. I will ask you to help me again. Are you familiar with an outbreak of infectious hepatitis in Delhi, India, in 1957?

A. Yes.

Q. Are you familiar with the coli count that was found at that time in the water source?

A. No.

Q. You do not know that it was below 5,000?

A. In the reports that I saw I would consider the laboratory evidence entirely unsatisfactory.

Q. I see. The reports that you saw, what did they indicate on the coliform count?

A. I couldn't tell what they were.

Q. I will ask you a general question, if you please, sir. Can you, percentagewise, by comparing volume of flow, determine the percentage of coliform organisms in water? In other words, if you had two sewers running into the same area, would the rate of flow be any indication of the coliform count? Could you determine, ordinarily, from rate of flow how many coliform would be in that particular sewage flow?

A. Not from the evidence that you--not from the data that you have given me so far, simply from rate of flow in the sewer.

Q. That is the answer I wanted from another witness. Thank you. Now, I don't know if you are familiar with the St. Joseph hearing or not. You were not there?

A. I wasn't there.

Q. You testified that at the intake at Kansas City, Kansas, water plant the coliform count, if I remember you correctly and quote you accurately, was approximately 27,000, is that correct, sir?

A. No, I said the fecal coliform were 25,000, I believe. At least that is what I intended to say.

Q. In St. Joseph, and I don't know if I am talking about the same thing, I believe it was testified that in the late summer of '58 the count was 44,000.

A. Well, it is my impression, and we can check this, but I believe fecal coliforms were not considered in relation to St. Joseph. I think these were total coliform.

Q. May I correct that? It was in '59, in the summer.

A. Well, it is immaterial the year, we can check it, but I say I believe fecal coliform were not used. Those were total coliforms, which are a different determination.

Q. What is the origin of the other coliform organisms that you are speaking of?

A. They may come from--the coliform group comes from intestinal contents, some from runoff that may also include intestinal contents from animals, and some of them may derive from vegetable sources.

Q. Do you have the total coliform count? You have given us the fecal coliform count. Do you have the total coliform count comparative with those particular numbers you gave us?

A. Yes.

Q. May we have those, please?

A. In the sample taken October 24 at Kansas City, Kansas, the total coliforms were 52,000, and this represents, then, fecal coliforms were 46 percent of the total. At Lexington, Missouri, on the 28th the coliform count was 160,000 per hundred ML. Again fecal coliforms represented 46 percent or 73,600.

MR. SAMSON: Doctor, give me the percent again there.

A. 46 in both cases. On October 26, the sample taken at Jefferson City showed 97,000 coliforms with 34 percent fecal coliforms, making 33,000 fecal coliforms. On October 28, the sample at Howard Bend showed 41,000 coliforms with 24 percent fecal coliforms, making 9,800 fecal coliforms per hundred ML.

MR. POWERS: Will you repeat that last figure, please, for Howard Bend?

A. 31,000 coliforms, 24 percent fecal coliforms, making 9,800 fecal coliforms per hundred ML.

MR. KOENIGSDORF: Thank you, sir.

CHAIRMAN WILSON: Does any other counsel wish to cross-examine? Members of the Board?

MR. SALOME: Mr. Chairman, I would like to ask a question of Dr. Kabler.

Q. (By Mr. Salome) Perhaps you answered it, but I want to have it clarified. Is there a dangerous stage on here on fecal coliform or is there a safe? In other words, you have got 24,000 up above Kansas City, Kansas. What is the danger point on this thing? Does it have to be Utopia, none, or what?

A. Well, if I might be a bit facetious, I would say feces is bad and more is worse.

Q. That is a good answer. But still--maybe I can get a little different answer on this here.

A. Well, no, sir, I mean I can't give you a numerical level at which you might consider yourself absolutely safe and above some places and some other numerical level at which you would start being a little dangerous. I don't think we should try to differentiate this.

Q. Let me ask this question. In some of these streams in the United States, and you are familiar with some of them, can you tell me how 24,000 above Kansas City compares with some of the safe areas that they speak about?

A. Compares with what?

Q. Well, they talk about the Ohio River being so very well taken care of, I think I have heard that. How does 24,000 fecal foliforms compare with what you have in the Ohio River or some other streams which have been worked on?

A. I don't have the figures of the Ohio River here with me.

Q. Well--

A. I have a remembrance that there is quite a variation, but at times just above the City of Cincinnati the level is much below the 9,800 that was cited here for Howard Bend. I don't have the figures on various stations of the Ohio, so that I regret I can't discuss that for you.

MR. SALOME: I think you probably have answered me all right. I don't know that I am particularly satisfied with it, but I don't know how to ask any more questions on the thing. I think your facetious remark handled it pretty well.

CHAIRMAN WILSON: Any other questions?

MR. EDELMAN: We have two questions.

MR. SAMSON: I have a question.

Q. (By Mr. Samson) Doctor, you have certain standards or norms that you go by on this coliform count that is, as you would say, satisfactory to certain activities on the river, don't you? I mean for swimming and boating, for instance, and also for water supply, you have certain minimum norms that in your business you say are satisfactory?

A. No, sir, as far as I am aware there are no government standards. Any such of those that are current are state or municipal, some sort of local regulations or standards.

Q. Can you tell us, then, or give us the benefit of your advice or your testimony in that connection pertaining to the local norms or standards that are customarily used? I think that is what Mr. Salome was trying to get to.

MR. SALOME: That is right.

A. Oh, I see. Well, I don't know of any that are in terms of fecal coliforms. They are in terms of total coliforms.

MR. SALOME: All right, then.

A. And in terms of fresh water bathing beaches there are some states that recommend 1,000 or less per hundred milliliter in order to be acceptable for fresh water bathing.

Q. (By Mr. Samson) All right, then you go from fresh water bathing, then, to public water supplies. What do some states have as a norm or a standard in connection with water for water supply, public water supply?

MR. KOENIGSDORF: May I object to questions of the commission as not being binding upon this defendant or any of these defendants or this commission in any way as to what the states do or fell is a proper norm?

CHAIRMAN WILSON: It will be taken subject to the objection. It may have some bearing when all of the evidence is in.

You may answer the question, Doctor.

A. What was your question?

MR. SAMSON: Will you take it off the record, please, my question?

(Question read)

MR. STEIN: Mr. Chairman, we think it might expedite matters if some of these questions could be directed at Mr. Kittrell, who will appear subsequently and is our expert in this area. We have no objection, though, if you want Dr. Kabler to answer these questions.

CHAIRMAN WILSON: I think it will take less time to get his answer than it will to argue the point, so I am going to let the doctor answer if he has an opinion.

A. Well, if Mr. Samson refers to proposed objectives that were once proposed by Mr. Streeter for acceptable water supply for full water treatment, that is 5,000 per hundred ML.

MR. SAMSON: That is what I had reference to.

Q. (By Mr. Johnson) That is total?

A. Total coliform.

Q. (By Mr. Samson) Yes. It is 5,000, then, on public water supply and somewhere in the neighborhood of 1,000 for public swimming, bathing, boating, and so forth?

A. The former are state recommendations. There are no government, as far as I know.

MR. SAMSON: That is all that I have. Thank you very much.

CHAIRMAN WILSON: Any other questions?

MR. RIDGE: Yes, may I have one question?

Q. (By Mr. Ridge) Do you have an opinion as to how far down the Mississippi you have to go to reduce this 40,000 to 5,000?

A. No, sir, I have no opinion.

Q. (By Chairman Wilson) Would it be reduced, Doctor, the further down you go?

A. I would expect them to from die-out, if he is talking about the original ones with no further pollution--

Q. (By Mr. Ridge) No further pollution, that is right.

A. --the number would progressively decrease and, of course, when it enters the Mississippi it should be further decreased by dilution and other factors.

CHAIRMAN WILSON: Any other questions?

A. But in terms of mileage, I can't answer the gentleman's question.

Q. (By Mr. Ridge) You can't answer it even discounting the dilution of the Mississippi?

A. No.

Q. (By Chairman Wilson) That could be determined by actual tests, I suppose?

A. By actual--well, you could determine the number present, buy to carry that back and assign their source would be very difficult.

CHAIRMAN WILSON: Any other questions?

MR. JOHNSON: Yes.

CHAIRMAN WILSON: Go ahead.

Q. (By Mr. Johnson) Doctor, you mean by that that it would be almost impossible because there would be additional pollution entering from the source to wherever it ended?

A. Yes.

Q. (By Mr. Samson) Doctor, I have one question. Mr. Koenigsdorf restricted you to the Kansas River on a question relating to whether or not you had any knowledge--

A. Yes.

Q. --as to any disease or any disability--

A. Yes.

Q. --arising in that neighborhood. Now, what would your answer be if the restriction as to the Kansas was lifted and you took in the Missouri in the general neighborhood of Kansas City, Kansas, and Kansas City, Missouri?

A. It would still be different, but if you would allow me to raise the restrictions still further I could recite you a long list.

Q. Well, I don't like to get into a lot of detail on that, but is it a long list?

A. Well, we can limit it to any number that you--we can limit it to a few, if you like.

Q. Could you limit it to just a few, then? Could you limit it to the Kansas City area generally?

A. There was one on the Missouri River at Chamberlain, South Dakota, in 1933, I think it was, in which there was a considerable outbreak of diarrhea, presumably due to a breakdown in the water treatment plant, that is in relation to the Missouri River.

Q. Do you have any objection to leaving that list with the commission and having it marked as an exhibit?

A. Well, there is only--the list that I have here, I don't have the official list with--actually an official list, Mr. Samson, but I can cite several orally here if you would like.

Q. Why don't you do that, then? Don't drag it out, but just give us a few examples.

A. There was quite a large outbreak in Minneapolis in 1935 of typhoid fever from the municipal water supply due to an insufficient chlorination. In January of this year there were some 1,400 cases of diarrhea in New York, Ravena-Coeymans area, due to municipal water supply, presumably a failure of the water treatment plant. In November of 1959 there were 14 cases of typhoid at Keene, New Hampshire, due to municipal water supply because of failure of filtering apparatus and this plant did not use municipal--or did not use chlorination. The Delhi outbreak that the counsel cited had an indeterminate number of infectious hepatitis cases varying from ten to fifty thousand, depending on how they were computed, which was laid to failure in the treatment of the water in the municipal water supply at Delhi.

MR. SAMSON: I believe that is all.

CHAIRMAN WILSON: Any other questions?

CROSS-EXAMINATION (Continued)

BY MR. KOENIGSDORF:

Q. Yes, I would like to ask, of those cities that you mentioned, Minneapolis and in New York and in New Hampshire, how many of those cities had sewage treatment plants?

A. Minneapolis has a sewage treatment--or has a--Minneapolis-St. Paul area has a sewage treatment plant.

CHAIRMAN WILSON: The intake there, however, is far above the treatment plant?

A. Oh, yes, miles above the treatment plant.

Q. (By Mr. Koenigsdorf) Well, I don't suppose you would know if it is untreated sewage above there. Is there untreated sewage that comes down from large cities above there?

A. I can give you more detail on the Keene, New Hampshire, plant. The water--

Q. Give Minneapolis while we started there and then you can go to the other one.

A. Minneapolis?

Q. Yes.

A. Yes, there is a city of about--it was then about 12,000, about 40 miles above Minneapolis.

Q. 12,000? Do you have any idea what the coliform count is there?

A. No.

Q. Wouldn't the die-out pretty well take care of anything from a city of 12,000 in 40 miles there?

A. I would suspect that there would be considerable left. I don't have the figures on it. I don't have the laboratory work on it here.

Q. Go ahead.

A. Is there a question pending?

Q. I thought you were going to talk about another city that you said you were more familiar with.

A. I think you asked a question about Keene, New Hampshire.

Q. Oh.

A. In that the watershed was supervised there so that the residents on the shed were quite limited. However, there were three people that were engaged in lumbering that were on the shed without the knowledge of the supervisors and one of these happened to be a typhoid carrier. The deposition of fecal material was flushed into a small stream in the fall freshet, took it into the city water supply and it went right on through.

Q. I would ask you, sir, in any event, whether you have sewage treatment or not, if you have a breakdown in your municipal water treatment if you might not be well apt to have some type of disease or illness resulting?

A. Possibly.

Q. Would it be possible or probable, sir?

A. Possible, I guess.

Q. Now, one question I would like to ask you on coliform. In the Potomac River what is the fecal coliform count or the coliform count, the highest, near Washington, D.C.? Do you know?

A. I don't know.

MR. KOENIGSDORF: Thank you.

MR. EDELMAN: May we have one more?

CHAIRMAN WILSON: Any questions?

REDIRECT EXAMINATION

BY MR. EDELMAN:

Q. Dr. Kabler, some reference was made to the Chanute, Kansas, recirculation of its sewage.

A. Yes.

Q. Did that community depend on its water treatment for the treatment of its sewage when the people drank the water or did they provide separate waste treatment before it went into their water supply?

A. I believe they gave full sewage treatment to the waste before they put it into the river, and I was told that the water aesthetically wasn't satisfactory. You asked about was it good water.

MR. EDELMAN: That is all.

CHAIRMAN WILSON: Any other questions?

That is all, Doctor.

(Witness excused)

MR. STEIN: Mr. Chairman, again we should like to ask your indulgence. We have Mr. Wheeler and Mr. Frazier of the Corps of Engineers who were the drivers of the boat this morning and they are on a schedule too. I wonder if we could ask those witnesses to come in before we recall Mr. Kittrell? We expect these witnesses may not take very long.

CHAIRMAN WILSON: Yes, you may call them.

MR. STEIN: Mr. Wheeler.

ORA J. WHEELER,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. STEIN:

Q. Mr. Wheeler, may we have your name and address?

A. Ora J. Wheeler, 109 East 40th Street.

Q. What is the city?

A. Kansas City, Missouri.

Q. What do you do, Mr. Wheeler?

A. I am a channel inspector for the Corps of Engineers.

Q. Does this involve your being on the Missouri River?

A. It does.

Q. How many years have you been on the river?

A. Well, I have completed my thirtieth year last February.

Q. In your duties as a channel inspector do you operate a boat?

A. Yes, sir.

Q. Can you describe some of your experiences in and around the Kansas Cities area, including the Kansas and the Missouri Rivers, in terms of what you have seen and smelled?

A. Well, it is just a mess, that is all I can say about it.

Q. Can you be more specific? Have you ever tried to use the river water as cooling water?

A. Yes, we do have some trouble with the water in the cooling of our boat. Not after we have started, but after our boat has laid up for a day or two in the Kansas City area we have trouble with the sewerage and grease and what-have-you that gets into the cooling system and clogs it.

Q. Do you ever moor your boat on the Missouri River at Kansas City below its confluence with the Kansas River?

A. Yes, sir, we tie it there most every week end.

Q. Have you ever had to flush out your cooling water system with water from the city main to clean out debris?

A. Usually every Monday morning it is the normal routine thing.

Q. Have you ever noticed deposits on the hulls of your boat?

A. Yes, sir, there is a greasy, oily deposit that gets on the hull at the water line and it usually takes gasoline to get it off.

Q. This involves considerable time to clean?

A. Yes, sir.

Q. Have you ever taken your boat up the Kansas River?

A. Yes, sir.

Q. What did you notice there?

A. Well, a bad stench, for one thing.

Q. Have you ever been near Turkey Creek Sewer outfall?

A. Yes, sir, I have been in it.

Q. What does it seem like to you? Could you describe it?

A. Need I?

Q. Is that the place you would like to spend your vacation?

A. No, sir.

Q. Have you ever seen pleasure boating on the Kansas River?

A. Yes, sir.

Q. On the Missouri River near the confluence with the Kansas?

A. Yes, sir.

Q. Have you ever seen water skiing in this area?

A. Yes, sir.

Q. Do you ever take your boat up the Missouri River above the confluence with the Kansas?

A. Yes, sir.

Q. Do the conditions of the Missouri River improve visually as you get above this confluence?

A. Oh, yes, it changes considerably. The odor leaves and the oil and grease and the sewerage, you don't have that above there.

Q. I take it that your occupational surroundings are the Missouri River and its tributaries in and about Kansas City. Would you think your working conditions would be more pleasant if the river were not polluted?

A. Very much so.

MR. STEIN: I have no further questions.

CHAIRMAN WILSON: Any cross-examination?

MR. KOENIGSDORF: Oh, a couple, if I might, please.

CROSS-EXAMINATION

BY MR. KOENIGSDORF:

Q. As a good marine man, Mr. Wheeler, after your boat has sat for a couple of days wouldn't you ordinarily clean out the cooling system--

A. No, sir.

Q. --before you start up again?

A. No, sir.

Q. You would not do that?

A. It is the only place on the river that we have to do that, is here at Kansas City.

Q. Have you been to St. Joe?

A. That is right.

Q. You don't have that problem at St. Joe?

A. No, sir, because I don't leave my boat tied below the packing house sewerage there.

Q. Is this the only place you leave your boat tied, is that right?

A. It is the only place I leave it tied so close to a sewer.

Q. Why don't you tie your boat somewhere else if you are going to do that?

A. You have to tie it where you can get to it and that is the logical place.

Q. That is the only place you can get to it?

A. That is right.

CHAIRMAN WILSON: Any other questions?

MR. KOENIGSDORF: Yes.

Q. (By Mr. Koenigsdorf) Do you know if the power and light company uses this water of the river for cooling without treatment?

A. Yes. I don't know about the treatment. I know they use the water for cooling.

MR. KOENIGSDORF: No further questions.

CHAIRMAN WILSON: Any other questions?

MR. SAMSON: I have got a question or two.

Q. (By Mr. Samson) Are you the same Mr. Wheeler that we saw on the boat this morning.

A. I am the one that gave you the shower bath. Not intentionally, though.

Q. Mr. Wheeler, if you will just turn around to your left there, there is Exhibit 8 up there.

MR. STEIN: 18, sir.

Q. (By Mr. Samson) 18, yes. I beg your pardon. Will you step up there and point out to us where you dock your boat and describe it as between C-5 and C-6.

CHAIRMAN WILSON: You mean where he went this morning?

MR. SAMSON: No, where he docks his boat.

A. We dock our boat here (indicating) in the Missouri River, below the--well, I see, you don't have the Hannibal Bridge on here. Right here below the Hannibal Bridge (indicating).

Q. (By Mr. Samson) What is the number on the tag?

A. C-2.

Q. C-2.

A. It is between C-2 and C-3.

Q. And that is where you customarily dock your boat, is that right?

A. That is correct, yes, sir.

MR. SAMSON: That is all. Thank you.

CHAIRMAN WILSON: Any other questions?

That is all, Mr. Wheeler.

(Witness excused)

GEORGE F. FRAZIER,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. STEIN:

Q. May we have your name and address?

A. George F. Frazier, 1826 Tennyson, Kansas City, Kansas.

Q. Mr. Frazier, what do you do?

A. I am a survey boat operator for the Corps of Engineers.

Q. How long have you been experienced on the river?

A. Some twenty-three years.

Q. Have you ever been involved in dredging operations in the Kansas Cities Metropolitan Area?

A. I have worked on a dredge, yes, sir.

Q. Have you ever had any experience with oil?

A. Well, not myself particularly, but the chief engineers on the boats have had, yes.

Q. Can you describe that?

A. Well, the only thing I could say was an oily substance that went through the filters and clogged the filters.

Q. Did this entail an interruption of the dredging operations?

A. Yes, it did.

Q. Have you seen any pleasure boats on the Kansas and Missouri Rivers in the Kansas Cities Metropolitan Area?

A. I have, yes.

Q. Would you say these pleasure boats are increasing?

A. Yes, they have been the past years.

Q. Have you seen any marinas on the river?

A. Yes.

Q. Can you describe to us where some of them are?

A. Well, there is one particularly we passed this morning at Randolph Bend about mile, oh, 371.8. And then in my territory there is one at Liberty Bridge, below Liberty Bridge--well, maybe correct this statement. There is also a boat landing, a municipal landing, above Chouteau Bridge, and then there is a boat club at Lexington, Missouri, and also Waverly, Missouri.

Q. Are you familiar with any marina in the Kansas River?

A. Well, only from people I have talked to that operate pleasure crafts on on the river, yes.

Q. Have you seen water skiing in and about the Kansas and Missouri Rivers?

A. I have.

Q. Have you ever seen anyone swim in the Kansas and Missouri Rivers?

A. I have.

Q. Have you ever seen anyone fish in there.

A. Yes.

Q. Have you noticed any significant odor on the Missouri River in the vicinity of Kansas City?

A. I have.

Q. Can you describe that odor?

A. Well, I couldn't tell you; just a terrible stink, that is all I could tell you, for some distance down the river.

Q. Some distance down from where?

A. From Kansas City down.

Q. Have you ever seen human feces in the water in the Kansas Cities Metropolitan Area?

A. You mean human manure?

Q. Yes.

A. I have.

Q. Have you ever seen condoms?

A. I have.

Q. Offal?

A. You will have to explain that.

Q. Packing house wastes and bedding.

A. Yes. Yes.

MR. STEIN: We have no further questions.

CHAIRMAN WILSON: Cross-examination?

MR. KOENIGSDORF: No.

CHAIRMAN WILSON: Members of the Board?

Q. (By Chairman Wilson) Mr. Frazier, are there any other waters available for recreation within, say, a few hours driving distance of these cities aside from the rivers, any lakes or other--

A. Yes, there is lakes in the Kansas City vicinity.

Q. How far?

A. Oh, within a radius of 15, 20, 40 miles.

Q. How many?

A. Do you want me to name the lakes?

Q. Well, I just wanted to know in a general way how many there are, how many places.

A. Well, that I am not familiar with. There is numerous lakes in the Kansas City vicinity.

Q. Is there pleasure boating and bathing on those lakes also?

A. Yes.

Q. In your observation is the amount of use of the rivers for these purposes affected by the presence of the sewage that we have heard about at this hearing?

A. Well, evidently not, to my knowledge; by the amount of people that boat ride on the Missouri River, evidently not, I would say.

Q. Do you mean that they do it in spite of the sewage?

A. Well, I would say they don't know about it, I would say that.

Q. Would the condition of the river or would this use of the river be increased if the sewage were eliminated by treatment?

A. Personally I would say yes.

CHAIRMAN WILSON: Any other questions?

That is all.

MR. STEIN: Thank you, Mr. Frazier.

(Witness excused)

MR. STEIN: We would like to recall Mr. Kittrell.

FRANCIS W. KITTRELL,

resumed the stand and testified further as follows:

DIRECT EXAMINATION (Continued)

BY MR. EDELMAN:

Q. Mr. Kittrell, did you as part of your official duties direct and participate in a study of the Missouri River in 1959?

A. Yes, I did.

Q. Can you tell us, was more than one study made?

A. Yes. We examined the river during three different periods.

Q. What was the first period that the river was examined?

A. The first period was October 15 through 21, 1959.

Q. What was the nature of this study? Was it a full-fledged study?

A. No, this was a preliminary study to determine the point on the Missouri below Kansas City where the coliform bacteria ceased to multiply or to increase and started to die away.

Q. Did that study establish such a point?

A. Yes, it did.

Q. Where was it located?

A. At Lexington, Missouri.

Q. What was the value at that time, the coliform value at that point?

A. The average of samples collected daily for a week was 153,500 per hundred milliliters.

Q. Was that near the Lexington Water Plant intake?

A. Yes, that was taken from the bridge acress the river at Lexington at a point close to the water plant intake, within about a half a mile.

Q. When was your next study made?

A. The next study was made from October 23 through 29, 1959.

Q. Did you establish sampling stations, sampling points, for this study?

A. Yes, I selected the points where samples would be taken.

Q. Did you make a study subsequent to this?

A. Yes, we made a third study of the river during the period December 7 through 20, 1959.

Q. Did you also establish sampling points for that study?

A. I did.

Q. Do you have a chart where these sampling points are indicated on the river?

A. Yes.

MR. EDELMAN: May we have it as Government Exhibit No. 54 for identification? The chart is captioned "Sampling Stations".

(Government's Exhibit No. 54 marked for identification.)

Q. (By Mr. Edelman) Will you briefly describe that chart, Mr. Kittrell, for the purpose of identifying it?

A. This is a chart representing the Missouri River and its principal tributaries in the reach from Kansas City to St. Louis, and it shows the location of sampling stations used during the studies.

Q. Do you consider that to be a fair representation of that stretch of the Missouri River?

A. Yes.

Q. And the relative distance between your sampling points?

A. Yes.

MR. EDELMAN: Offer this in evidence as Exhibit No. 54.

CHAIRMAN WILSON: Any objection?

Proceed.

(Government's Exhibit No. 54 received in evidence.)

Q. (By Mr. Edelman) Will you, by referring to Government Exhibit No. 54, indicate the location of your sampling stations for your studies of October 23 to 29?

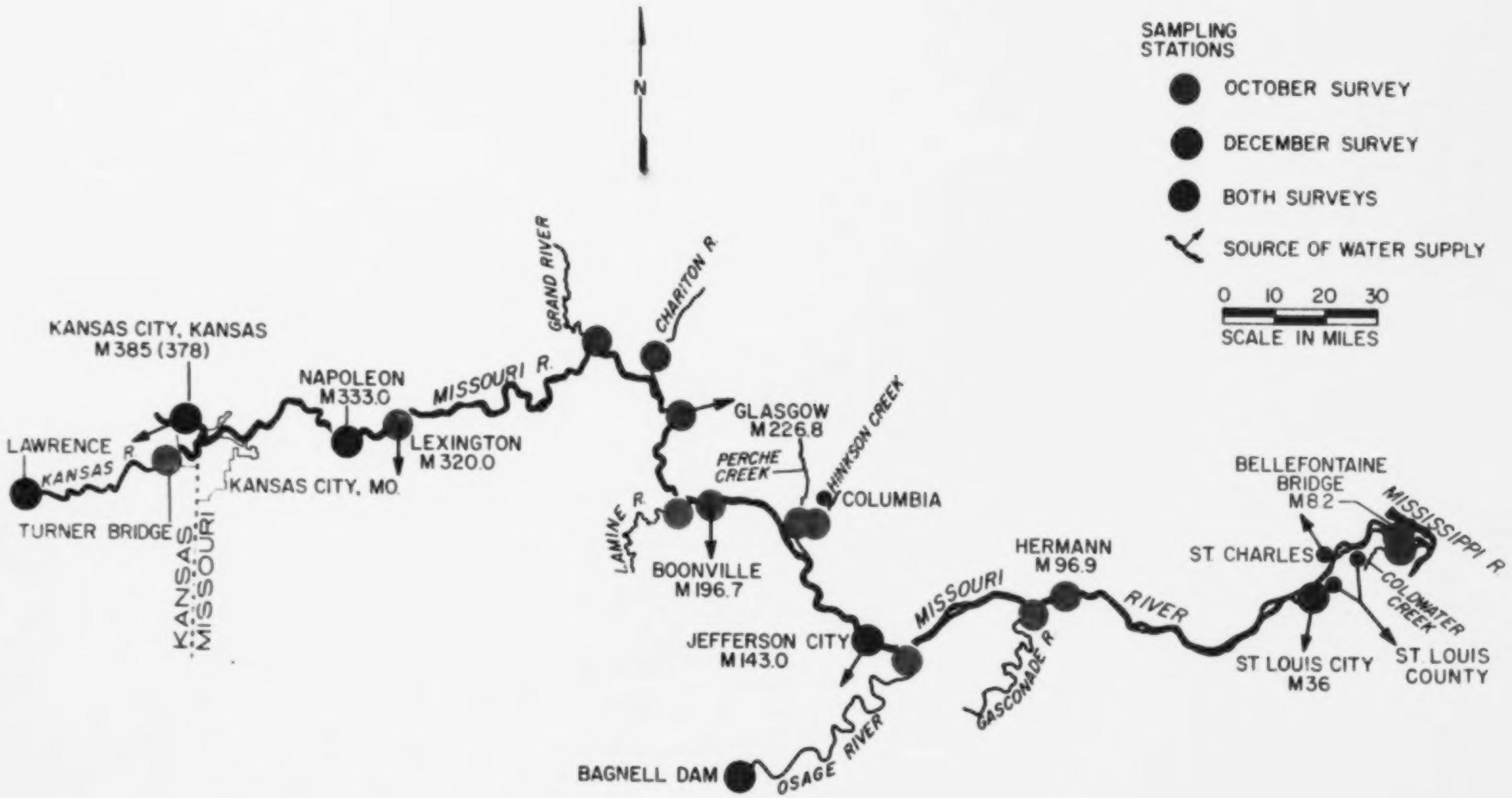
A. Yes. On the main river we had a sampling station above Kansas City, the Kansas City area, at the Kansas City, Kansas, water plant intake. A second station downstream was located at Lexington, below all wastes from the Kansas Cities Metropolitan Area.

Q. You are pointing to a red circle, Mr. Kittrell?

A. A red circle, yes.

Q. Is that significant?

A. Well, we have distinguished the sampling stations used during the two studies by different colors. The blue stations were used during both studies. The red stations were used during the study of October 23 through 29. The green stations were used only during the study of December 7 through 20.



MISSOURI RIVER BELOW KANSAS CITY
METROPOLITAN AREA

SAMPLING STATIONS

The second station on the on the main stream was at Lexington. There was a third one at Glasgow, a fourth one at Boonville, a fifth one--I am going a little slow here. I will start back again. The second one at Lexington, the third one at Glasgow, the fourth one at Boonville, the fifth one at Jefferson City, the sixth one at Hermann Bridge, the seventh one at the St. Louis City Water Plant intake, the water intake of the Howard Bend plant at St. Louis, and the eighth was at Bellefontaine Bridge, eight miles above the mouth of the Missouri. In addition we had sampling stations on the principal tributaries which are shown also by the red circles, one on the Kansas River above the Kansas Cities Metropolitan Area, one on the Grand River, one on the Chariton River, one on the Lamine River, one on the Perche Creek, which drains the area of Columbia, Missouri, one on the Osage River, one on the Gasconade River, and finally one on Coldwater Creek in St. Louis.

Q. Do these sampling stations on the tributaries that you have referred to include all the tributaries to the Missouri River or are there others that you haven't mentioned?

A. There are other smaller tributaries which we did not include. The break point on the stations--on the tributaries that we sampled was at a flow of about 40 cubic feet per second. In other words, we sampled all streams that had flows in excess of 40 cubic feet per second, which represents about one-tenth of one percent of the flow of the Missouri River during that October period.

Q. In your opinion did the tributaries that you did exclude whose flow was less than the 40 cubic feet per second represent any substantial source of bacterial or other pollution of the Missouri River?

A. Not in my opinion, no.

Q. Would you tell us generally how the samples were taken and this study conducted?

A. During the October 23 through 29 study we collected samples, single samples, at each station on the main stream every three hours for a period of seven days. On the tributaries during the same period we collected samples once per day on each tributary. These samples then were taken into the laboratories. We had three different laboratories for this period, one at the Kansas City, Kansas, water plant, one at the University of Missouri at Columbia, and one in the county health department at St. Louis. These samples were taken into these laboratories and examined for the various constituents that we were interested in. All procedures, sampling, transportation of samples, and the examination of samples were in accordance with recommendations of standard methods for the analysis of water, sewage and industrial wastes.

Q. As part of this study, Mr. Kittrell, did you analyze and evaluate information leading to a determination of sources of bacterial contamination of the Missouri River in this stretch that is covered in Exhibit No. 54?

A. Yes, I did.

Q. Did you prepare a chart which visually represents your statistical findings?

A. Yes.

MR. EDELMAN: May we have that?

This chart labeled "Sources of Bacterial Contamination" is offered for identification as Government Exhibit No. 55.

(Government's Exhibit No. 55 marked for identification.)

CHAIRMAN WILSON: Mr. Secretary, could you move that chart over to the left if no use is going to be made of that other map? Some of the Board members can't see it where it is.

Q. (By Mr. Edelman) Will you briefly describe that chart for purposes of identification, Mr. Kittrell?

A. This chart is a representation of the Missouri River in the reach from Kansas City to its mouth at the Mississippi River and it shows the approximate points on the river at which the wastes are discharged which carry sewered or bacterial contamination from sewage and, in the case of the Kansas City area, from the packing house wastes into the river.

MR. EDELMAN: We offer this as Government Exhibit No. 55 in evidence.

CHAIRMAN WILSON: Any objection?

Received.

(Government's Exhibit No. 55 received in evidence.)

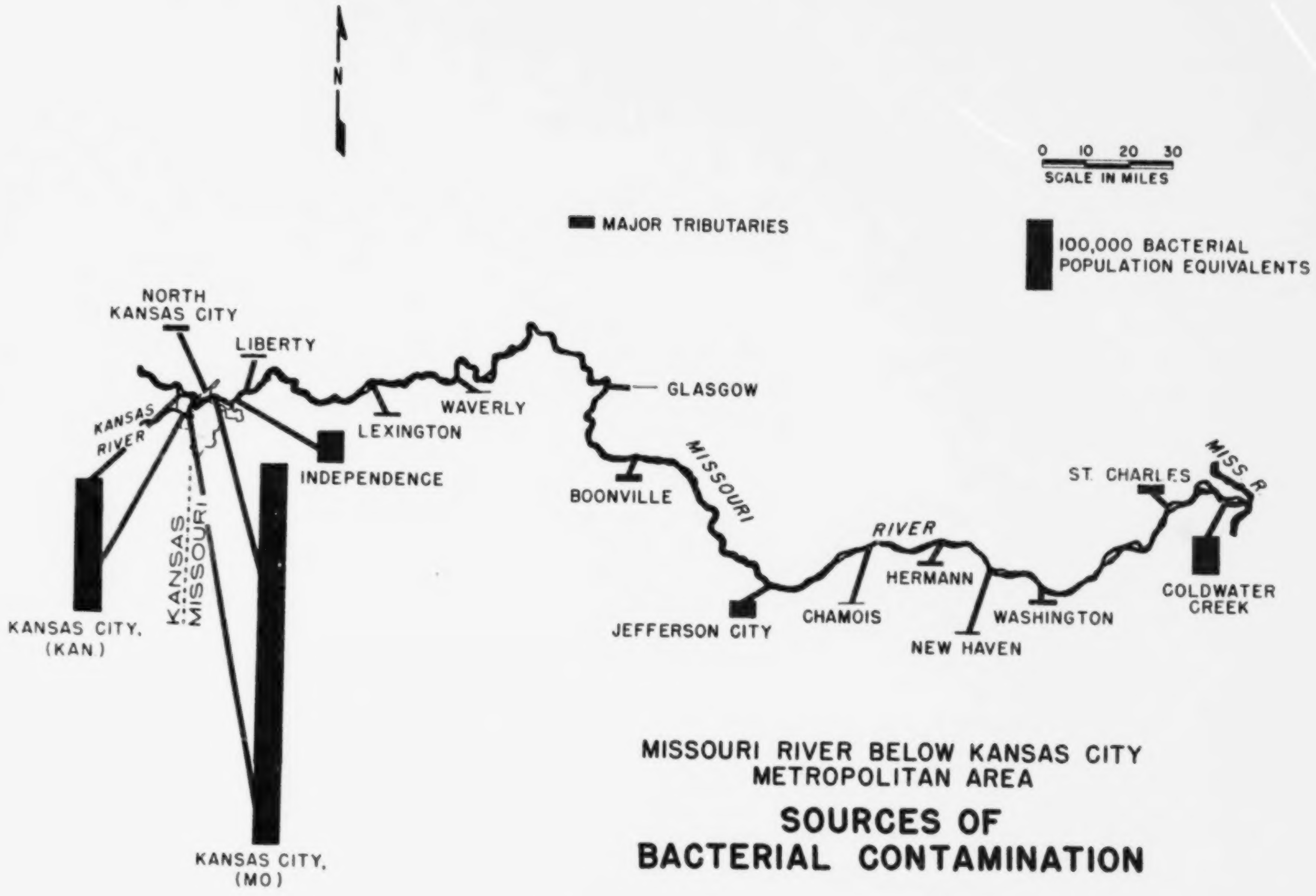
Q. (By Mr. Edelman) On what basis did you make your determination of these sources, Mr. Kittrell? What information did you use?

A. Except for the packing house wastes from Kansas in the Kansas City Metropolitan Area, the height of these bars represents sewered population. For the packing house wastes I have, as I explained earlier, made a certain allowance for the wastes from the packing houses.

Q. What basis did you use for that allowance?

A. That was based on our experience elsewhere, where we have measured the bacterial contamination and wastes discharged from packing houses and have related that to the live weight of kill in the packing houses.

Q. Did you get the live weight information in this case to make that allowance?



MISSOURI RIVER BELOW KANSAS CITY
METROPOLITAN AREA

SOURCES OF BACTERIAL CONTAMINATION

A. Yes. And using that live weight we estimated the bacterial contamination from the packing houses in this area.

Q. Do you consider such an estimate, in your opinion, to be a reasonably sound one from a scientific point of view?

A. I believe it to be, yes.

Q. Would you now tell us what this chart represents and what figures it represents?

A. Over on the upper right-hand portion of the chart we have a bar which represents 100,000 I have called it bacterial population equivalents, because of the presence of packing house wastes. In the absence of those wastes I would simply have called this 100,000 sewered population. Starting in the Kansas City Metropolitan Area, the farthest bar to the left on the chart represents 184,200 bacterial population equivalent or sewered population equivalent. This bar has two different colors. The red portion of the bar represents the wastes that go into the Missouri River, the green part of the chart represents the portion going into the Kansas River from Kansas. The total from Kansas represents 20.7 percent of the total sewered population equivalent for the entire reach of the river.

The next bar in the Kansas City area represents the wastes from Kansas City, Missouri, in terms of sewered population equivalent. Here again the green portion of the bar represents the part of the wastes going to the Kansas River, the red portion represents that going to the Missouri River.

In the Kansas City area we also have North Kansas City-- Oh, I failed to mention the sewered population equivalent number for Kansas City, Missouri, 533,100 or 59.9 percent of the total.

We also have North Kansas City, which has a sewered population equivalent of 7,400 or 83 percent of the total.

Q. You say 83 percent or .83?

A. .83, I am sorry. .83 of the total.

Independence, Missouri, which I consider in the metropolitan area because we had no sampling points between this area and Lexington, had a sewered population equivalent of 46,300 or 5.2 percent of the total.

Liberty, Missouri, which comes into the river a short distance below Independence, had a sewered population equivalent of 4,500 or .51 of one percent.

Now, from there on down we have a number of relatively small sources of contamination and I will not name them independently unless someone wants them to be named separately. There are some about ten of them which represent about seven and a half percent of the total sewered population.

MR. JOHNSON: May I ask what Jefferson City represents?

A. Jefferson City represents 24,600 or 2.76 percent.

MR. JOHNSON: Thank you.

A. Except for Jefferson City, none of those in this total represent more than, oh, about one-half of one percent.

Then at St. Charles in the St. Louis area, St. Charles has a sewered population equivalent of 13,750 or 1.54 percent of the total. And finally Coldwater Creek, which carries sewage from St. Louis, has a sewered population equivalent of 56,600 or 6.36 percent of the total.

Q. (By Mr. Edelman) Mr. Kittrell, did you as part of this study compute the biochemical oxygen demand of organic wastes discharged into the river in this stretch?

A. Yes, I did.

Q. Do you have that chart?

A. Yes.

MR. EDELMAN: I ask that this chart labeled "Sources of Organic Wastes" be entered as Government Exhibit 56 for identification.

(Government's Exhibit No. 56 marked for identification.)

Q. (By Mr. Edelman) Will you describe this chart briefly, Mr. Kittrell, for purposes of identification?

A. This is a very similar chart to the previous one, representing the Missouri River and the sources of wastes entering the Missouri River between Kansas City and St. Louis in terms of the biochemical oxygen demand population equivalent.

MR. EDELMAN: I offer this as Government Exhibit No. 56.

CHAIRMAN WILSON: Any objection?

Received.

(Government's Exhibit No. 56 received in evidence.)

Q. (By Mr. Edelman) What information did you use to compute this biochemical oxygen demand, Mr. Kittrell?

A. This was a combination of data obtained from the official files of our regional office and the sampling that we did on Turkey Creek Sewer.

Q. Will you tell us what your computation disclosed and refer to Exhibit No. 56 during your statement?

A. In the upper right-hand portion of the chart is a bar, the height of which represents 100,000 population equivalent based on BOD. At the extreme left of the chart is the bar representing the waste discharged from the Kansas portion of the Kansas Cities Metropolitan Area. The blue portion of the bar represents that portion discharged from Kansas into the Kansas River; the orange portion represents that part discharged directly to the Missouri. The population equivalent of the wastes from Kansas was 639,000 or 38.7 percent of the total discharged to this entire reach of the river.

The bar to the right of the one that I just described represents the waste load from Kansas City, Missouri, for a total of 748,800 or 45.3 percent of the total organic wastes discharged to this reach of the river. The orange portion of this bar represents the amount from Kansas City, Missouri, discharged into the Missouri River; the blue portion represents that discharged into the Kansas River.

CHAIRMAN WILSON: Will you give us the figures on those relative proportions?

A. I can look them up. Yes, I will have to look them up here.

CHAIRMAN WILSON: If it is going to take you some time to find those figures, you might look them up and produce them in the morning.

A. I believe it is going to take a little longer than I thought. I thought I could put my finger right on it, but I believe not.

CHAIRMAN WILSON: Very well. Go ahead.

A. The organic wastes from North Kansas City are equivalent to 120,000 population equivalent or 7.26 percent of the total.

From Independence the population equivalent of the wastes is 44,000 or 2.66 percent of the total.

And from Liberty the population equivalent is 4,700 for .28 percent of the total.

Here again, combining the ten communities that I discussed for the sewered population equivalent, we have a total of 2.88 percent of the total from these ten communities from Lexington down to Washington. St. Charles contributed a population equivalent of 14,970 or .9 of one percent of the total, and Coldwater Creek 33,700 or 2 percent of the total.

Q. (By Mr. Edelman) In reaching these values, Mr. Kittrell, did you include or exclude whatever was contributed by the tributaries you mentioned?

A. I did not take that into consideration in the BOD chart. I did on the previous chart, No. 55, for sources of bacterial population equivalents, and this small bar near the top of the chart represents the total sewered population equivalent from all of the tributaries that we sampled except the Kansas River and Coldwater Creek. In other words, these are the more or less uncontaminated streams that we were dealing with. This gave a total of 13,300 for all of the tributaries combined.

Q. Returning to the samples that were taken on the river, I believe you indicated that these were analyzed in the laboratory?

A. Yes.

Q. And values reached for the coliform present at the sampling stations?

A. That is correct.

Q. Do you have a chart which indicates those coliform findings?

A. I do.

MR. EDELMAN: Could we have it?

This is offered as Government Exhibit No. 57 for identification. It bears the legend "Bacterial Contamination of River October 1959".

CHAIRMAN WILSON: Are you offering that now?

MR. EDELMAN: For identification, Mr. Chairman.

(Government's Exhibit No. 57
marked for identification.)

Q. (By Mr. Edelman) Will you briefly describe that chart, Mr. Kittrell, for purposes of identification?

A. This chart is a plotting of the results of determination of coliform bacteria from the Kansas City area down to the mouth. The bottom scale represents the number of hours of time of water travel from the Kansas City Water Plant to the mouth of the river. The figures on the left-hand edge of the chart are for coliform bacteria, mpn per hundred, again in terms of thousands.

Q. Does this chart represent an accurate visual presentation of your statistical findings?

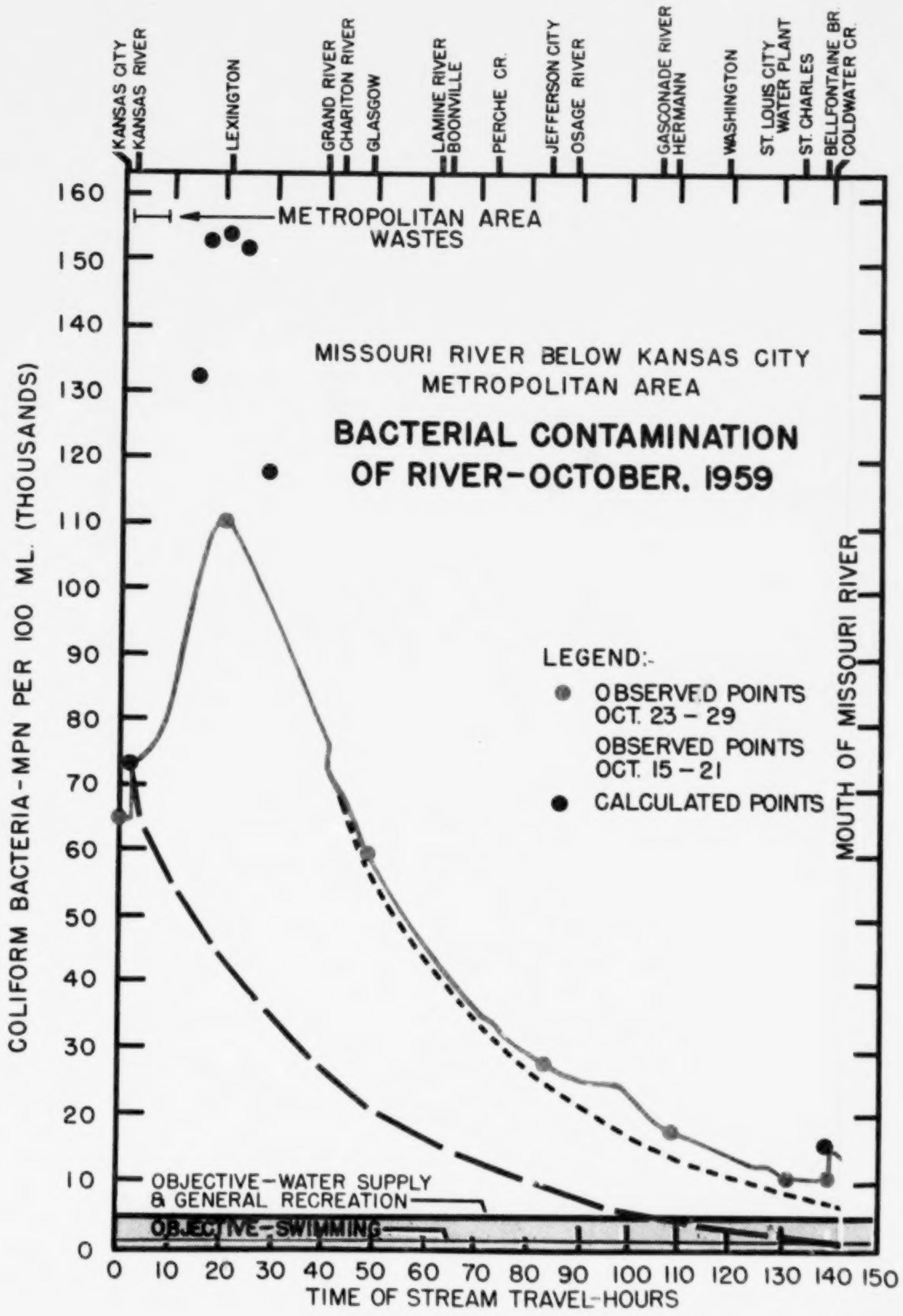
A. It does.

MR. EDELMAN: We now offer this in evidence, Mr. Chairman.

CHAIRMAN WILSON: Any objection?

It will be received.

(Government's Exhibit No. 57
received in evidence.)


MISSOURI RIVER BELOW KANSAS CITY METROPOLITAN AREA
BACTERIAL CONTAMINATION OF RIVER–OCTOBER, 1959
KANSAS CITY
KANSAS RIVER
LEXINGTON
GRAND RIVER
CHARITON RIVER
GLASGOW
LAMINE RIVER
BOONVILLE
PERCHE CR.
JEFFERSON CITY
OSAGE RIVER
GASCONADE RIVER
HERMANN
WASHINGTON
ST. LOUIS CITY WATER PLANT
ST. CHARLES
BELLFONTAINE BR
COLDWATER CR.
METROPOLITAN AREA WASTES
LEGEND:-
OBSERVED POINTS OCT. 23 – 29
OBSERVED POINTS OCT. 15 – 21
CALCULATED POINTS
MOUTH OF MISSOURI RIVER
OBJECTIVE–WATER SUPPLY & GENERAL RECREATION
OBJECTIVE–SWIMMING
COLIFORM BACTERIA–MPN PER 100 ML. (THOUSANDS)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
TIME OF STREAM TRAVEL–HOURS
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150

Q. (By Mr. Edelman) Will you tell us, Mr. Kittrell, what your laboratory analysis and your evaluation of those results indicated with respect to levels of coliform concentration in this reach of the Missouri River?

A. Yes. Above the Kansas Cities Metropolitan Area at the Kansas City Water Plant intake we found an average mpn of 65,000 per hundred milliliters. At that particular time the Kansas River had a higher level of coliform organisms than the Missouri River above Kansas City and that raised the level of the combined rivers above town to an mpn of 73,500, that is before either of the rivers received any wastes from the Kansas Cities Metropolitan Area.

At Lexington we found an average coliform mpn of 110,000 per hundred milliliters.

Q. You are pointing to a red dot, Mr. Kittrell, is that correct?

A. That is correct. Proceeding on downstream, at Glasgow we had an average mpn of 60,600, at Jefferson City an mpn of 27,400, and I believe this chart omits one point through error. We also had a station at Boonville which had an average coliform mpn of 31,300.

Q. That point--

A. That point would fall a little below the chart in this particular case.

Q. A little below the red line?

A. A little below the orange line, yes. At the Hermann Bridge we had an average mpn of 17,800, the St. Louis Water Plant intake an mpn of 10,800, and at the Bellefontaine Bridge an average mpn of 11,100. We computed the addition--

MR. SAMSON: Pardon me for interrupting you, Mr. Kittrell, but at the point where you had 10,800, where is that?

A. That is the St. Louis City Water Plant intake, the Howard Bend Plant.

MR. SAMSON: That is above--

A. That is above wastes from St. Louis.

MR. SAMSON: And then you had an item of 27,400. That is at Jefferson City, isn't it?

A. That is at Jefferson City, yes.

MR. SAMSON: Thank you very much.

A. We did not sample at Coldwater Creek on the Missouri, but by calculation of the data on the Missouri River and Coldwater Creek we estimated that Coldwater Creek increased the coli in the river just above its mouth to about 14,500.

Q. (By Mr. Edelman) Mr. Kittrell, you have some marks that look to me like black circles on the chart in addition to the orange circles that you pointed to. What do those represent?

A. Those represent the results that we obtained in the vicinity of Lexington during the first study, that of October 15 through 21, when we were establishing the point at which the coliform bacteria ceased to multiply and started to decrease. That showed the peak at Lexington at a value of 150,000 per hundred milliliters.

Q. Mr. Kittrell, in establishing the values for the orange points that you have indicated on Government Exhibit No. 57, did you include all samples you obtained from the Missouri River during this period of October 23 to 29?

A. No, we did not. During the early part of that week we had a considerable amount of rain in the Kansas City area and this resulted in surface runoff which brought into the river faily large numbers of coliform bacteria that we knew were not of direct sewage origin, so that we plotted up the data that we got for the entire seven days and on the basis of these plottings we excluded from the data that we used for averaging those values which showed the influence of surface runoff. So we picked out in some cases three days of around-the-clock sampling, in other cases we picked out four, in some cases five days which were not influenced by the effects of surface runoff.

Q. If you had included this data, would these values be higher or lower or about the same?

A. They would be considerably higher, in the range of two to three times the values that we have actually shown plotted here.

Q. In other words, in your opinion the values shown on this chart represent or reasonably represent the dry weather flow of the river?

A. Yes, the coliform organisms of sewage origin, yes, during a period of relatively dry flow.

Q. Mr. Kittrell, the lines on the bottom of that chart, Government Exhibit No. 57, indicate "Objective Water Supply" and "General Recreation". What does that represent?

A. The line enclosing the blue area of the chart is at the 5,000 per 100 milliliter level, which is the objective for sources of municipal water supply adopted by the Missouri Basin states.

Q. Does it also represent the recommended objective for general recreation?

A. That is right, the same value represents the level for general recreation such as boating and fishing, but does not include swimming. For swimming a lower level objective has been adopted, that of 1,000 per hundred milliliters.

Q. Do any of the points on the solid orange line on that chart meet either of these objectives?

A. No, at no point where we examined the river were these objectives met.

Q. Mr. Kittrell, can you tell us what proportion of the pollution evidenced by the solid orange line is attributable to discharges from the Kansas Cities Metropolitan Area?

A. Yes, we have computed such values. On the chart you will see two dotted lines, the upper one of which is black and the lower one is red. The upper dotted black line represents a projection of the death rate or the die-away rate of the coliform bacteria from the Kansas Cities Metropolitan Area and above. The lower red dashed line represents the die-away of the coliform bacteria from above Kansas City. By difference between the two lines we can obtain the contribution of coliform bacteria from the Kansas Cities Metropolitan Area to any point downstream or at any point downstream.

Q. Can you tell us, Mr. Kittrell, if you were to make that computation whether you could also determine what proportion of this total contribution was attributable to Kansas City, Missouri, and what proportion attributable to Kansas City, Kansas?

A. We have done that on the basis of the proportional sewered population of Kansas City, Kansas, and Kansas City, Missouri, to the total sewered population of the metropolitan area.

Q. Can you give us the proportionate share at Lexington?

A. At Lexington we had a total observed, as I said before, of 110,000. By difference the mpn from the Kansas Cities Metropolitan Area is 66,000 per hundred milliliters. Of that, Kansas City, Missouri, contributed 69.8 percent or 45,500. Kansas City, Kansas, contributed 23.8 percent or 15,700.

Q. What is the next station you have?

A. The next station is Glasgow and at this point the coliform contribution from the Kansas Cities Metropolitan Area was 35,000, of which 24,000 were from Kansas City, Missouri, and 8,000 from Kansas City, Kansas.

Q. When you get down to Jefferson City, is there still a contribution?

A. Yes, the computed contribution from the total area at Jefferson City is 15,000, of which 10,300 are from Kansas City, Missouri, and 3,600 from Kansas City, Kansas.

Q. How about when you get down to St. Louis?

A. At the St. Louis Water Plant the estimated or the computed contribution from the Kansas Cities Metropolitan Area is 4,900, of which 3,800 are from Kansas City, Missouri, and 1,100 from Kansas City, Kansas.

Q. Do you consider these contributions to be significant in terms of indicating a potential health hazard?

A. Yes, I do.

Q. You indicated earlier you made another study of the Missouri River in December of 1959?

A. That is correct.

Q. Did you establish sampling stations for that study?

A. Yes.

CHAIRMAN WILSON: Counsel, are you entering into another phase of the examination? It is after 5 o'clock now. I assume your examination of Mr. Kittrell is going to take some further time.

MR. EDELMAN: Well, we anticipate that this concluding portion of his testimony would take between 15 to 25 minutes.

CHAIRMAN WILSON: Well--

MR. EDELMAN: That is the direct examination.

CHAIRMAN WILSON: What?

MR. EDELMAN: The direct examination would take at least 15 minutes.

CHAIRMAN WILSON: I am going to ask the Board members. Do you think we ought to stretch it out that long?

(Off the record)

CHAIRMAN WILSON: I think it is the consensus of the Board that we should adjourn now, gentlemen.

But before we do, may I ask how much longer the government's case is likely to take?

MR. STEIN: At least tomorrow.

CHAIRMAN WILSON: You think you will probably be through tomorrow, then?

MR. STEIN: We will hopefully be through tomorrow, depending upon the length of cross-examination. If cross-examination is lengthy, of course, we would estimate we would run on a little bit of Thursday.

CHAIRMAN WILSON: Recess until 9 o'clock tomorrow morning.

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WHEREUPON, the hearing was adjourned until 9 o'clock a.m. of the following day, at which time the following further proceedings were had and entered of record, to-wit:

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MORNING SESSION, WEDNESDAY, JUNE 15, 1960

CHAIRMAN WILSON: The hearing will come to order.

MR. EDELMAN: I would like to recall Mr. Kittrell.

FRANCIS W. KITTRELL,

resumed the stand and testified further as follows:

DIRECT EXAMINATION (Continued)

BY MR. EDELMAN:

Q. Mr. Kittrell, at the conclusion of your testimony yesterday a question was raised as to the contribution from Kansas City, Kansas, and from Kansas City, Missouri, that enters the Missouri River. Do you have the figures on that now?

A. Yes, I do.

Q. Will you please go ahead on that?

A. Based on sewered population equivalent, the total discharged to both streams from the Kansas portion of the Kansas Cities Metropolitan Area totaled 184,200. Of this 143,200 discharged to the Kansas River, 41,000 directly to the Missouri River.

Q. What is this?

A. These are sewered population equivalents, sources of bacterial contamination. From the Missouri side or from the Missouri portion of the Metropolitan area there is a total of 533,100 sewered population equivalent, of which 110,000 are discharged to the Kansas River and 423,100 discharged to the Missouri River or to the Blue River or other streams than the Kansas River. On the basis of BOD population equivalent--

Q. You are now going to give us the sources in terms of the BOD population equivalent, Mr. Kittrell?

A. That is right. The total from the Kansas portion of the metropolitan area 639,200, of which 543,600 is discharged to the Kansas River, 95,600 to the Missouri River. From the Missouri portion of the metropolitan area a total of 748,800, of which 197,800 are discharged to the Kansas River and 551,000 to other streams.

MR. RIDGE: Could we have the first two figures again, please?

A. That is the sewered population equivalent or the BOD population equivalent?

MR. RIDGE: Sewered.

A. And you are asking for Kansas or the Missouri?

MR. RIDGE: Both of them.

A. Both.

MR. BRENNEISEN: Mr. Chairman, I wonder if we could ask the witness to distinguish between Kansas and Kansas City, Kansas? There is a very heavy sewage influx in the Kaw River besides Kansas City, Kansas, or inside the city limits and it is very confusing to us whether he is intending to say it is from Kansas City, Kansas, or from the State of Kansas.

A. I was referring, I am sorry, to the Kansas City, Kansas, portion of the metropolitan area.

CHAIRMAN WILSON: Well, I think that is a very relevant question and I made a note here to check up on it myself if it wasn't brought out by the government in further questioning, and that is that under the terms of the act we are concerned here with the origin of the discharge. The act fixes responsibility according to where the discharge originates. Now, if any further clarification of your testimony on that account is necessary, Mr. Kittrell, will you please comment on it.

A. Well, the figures that I have given for Kansas are those for Kansas City, Kansas. The ones I have given for Missouri are all other portions of the metropolitan area which are in Missouri.

CHAIRMAN WILSON: And are you speaking in terms of where the discharges originate, that is where the homes and industries are located which produce the sewage or industrial wastes as distinguished from the actual points of outfall? Are your figures based on the places where the sewage and industrial waste originates, in which state?

A. With the exception of the stockyards area, which was discussed yesterday, to the best of my knowledge these figures refer to wastes originating in the states that I specify or in the areas that I specify.

CHAIRMAN WILSON: In other words, to illustrate, with reference to the Turkey Creek outlet it appeared in the testimony that about five percent of the discharge through that originated in Kansas and the remainder in Missouri.

A. In this case I have credited that to Kansas.

CHAIRMAN WILSON: Yes. But in the case of the stockyards, do I understand that you are unable to make an apportionment because of the fact that the stockyards overlie the state line?

A. The data I had did not make such a breakdown, that is correct.

CHAIRMAN WILSON: But as we have heard from the testimony, the total discharge from those outlets is a relatively small portion of the entire amount that we are concerned with?

A. That is correct, yes.

CHAIRMAN WILSON: And with that exception, your testimony that you have just given is based upon the origin of the sewage or industrial wastes, as the case may be?

A. Yes. And I may have just made a misleading statement. I said that from Missouri I was including everything in the metropolitan area. That was not correct. I am including only Kansas City, Missouri, in the figures I am giving at this moment.

MR. KOENIGSDORF: Does that include industrial and Turkey Creek?

A. Everything that I have information on that originates in Kansas City, Missouri.

MR. KOENIGSDORF: You didn't break it down by Turkey Creek and the others?

A. No, not in this particular case.

CHAIRMAN WILSON: Now, I am not sure I understood what you were just pointing out when you speak of the metropolitan area. I made a note also to ask you just what components you include in the term metropolitan area.

MR. EDELMAN: Mr. Chairman, the question that I asked the witness, and I think the record will show, was whether he had computed the contribution of wastes originating in Kansas City, Kansas, and wastes originating in Kansas City, Missouri. I understand the witness's testimoney is in response to that question and includes wastes discharged and identified as originating in Kansas City, Kansas, and originating and discharged from Kansas City, Missouri. Is that correct, Mr. Kittrell?

A. That's correct. And this is a--

CHAIRMAN WILSON: I guess you didn't get the point of my question, Mr. Edelman. The witness has used the term several times in his testimony of metropolitan area. Now, so that there won't be any misunderstanding about what he meant I am just asking him to describe the geographical and political components that he is referring to when he uses the term metropolitan area.

MR. EDELMAN: Thank you, Mr. Chairman.

A. For purposes of our stream study I have designated the metropolitan area to include Kansas City, Kansas, Kansas City, Missouri--

Q. (By Mr. Edelman) Mr. Kittrell, I am not sure I understand the question you are responding to. Can you give us the proportionate contribution of sewage discharged from Kansas City, Kansas, and the amount discharged from Kansas City, Missouri?

CHAIRMAN WILSON: Just a minute, Mr. Edelman. Please let him answer my question.

MR. EDELMAN: Oh, I didn't understand that there was a question pending.

CHAIRMAN WILSON: I think it is quite important that we should all understand, entirely irrespective of the relative discharges, what he means from the geographical and political standpoint by the term metropolitan area.

Now, if you will start again, please, Mr. Kittrell, and tell us just what places and areas you include in the term metropolitan area.

A. For the purpose of my stream study I have designated the metropolitan area as including Kansas City, Kansas, Kansas City, Missouri, North Kansas City, Missouri, Independence, Missouri, and Lexington, Missouri. I have done this because it was not feasible to separate these various jurisdictions by sampling the river itself; they are too close together to permit sampling between these various sources in such a way that it will permit a breakdown by sampling in the river itself.

CHAIRMAN WILSON: Now, as the maps indicate and as we have heard from the testimony, there is considerable discharge of sewage or industrial waste from what is called here the Fairfax Industrial District. Do you or do you not include that as part of Kansas City, Kansas?

A. I have, yes.

CHAIRMAN WILSON: Do you know whether it is within the municipal limits of Kansas City, Kansas?

A. No, of my own knowledge I do not. I have assumed that it was, but I do not know that.

CHAIRMAN WILSON: At any rate, referring to the map that was introduced in evidence--what exhibit number was that?

MR. POOLE: 14.

CHAIRMAN WILSON: --14, you have included, along with Kansas City, Kansas, as part of the metropolitan area the Fairfax Industrial District?

A. That is correct.

CHAIRMAN WILSON: How about the Argentine Industrial District shown south of the main district of Kansas City, Kansas?

A. Yes, I have.

CHAIRMAN WILSON: You include that?

A. Yes.

CHAIRMAN WILSON: And then you also include the main City of Kansas City, Missouri. North Kansas City, Missouri, and Independence and Lexington downstream?

A. Not Lexington; Liberty.

CHAIRMAN WILSON: Oh, Liberty. I misunderstood you. Independence and Liberty. All these components are adjacent, then?

A. That is correct.

CHAIRMAN WILSON: And constitute together a contiguous block of territory?

A. That is correct.

CHAIRMAN WILSON: Very well.

MR. BRENNEISEN: Mr. Chairman, I don't like to interpose here, but I think it should be clarified. I think your exhibit shows that Fairfax is not in Kansas City, Kansas. I think the maps show that the large industrial district we talk about, the other industrial district, is outside the city limits of Kansas City, Kansas.

MR. EDELMAN: May I ask which exhibit you are referring to?

MR. BRENNEISEN: Well, this one right here.

MR. SAMSON: 14.

CHAIRMAN WILSON: Well, of course, Mr. Brenneisen, that is a different matter. Whoever can establish the political composition of this area by competent testimony may do so. This witness has told us what he took into consideration. We are simply getting his definition of the metropolitan area, any--

MR. BRENNEISEN: And of Kansas City, Kansas. I want to be sure--

CHAIRMAN WILSON: Anyone else concerned from the standpoint of political organization or fixing responsibility will certainly be at liberty to show what the true situation is on that.

MR. EDELMAN: Mr. Chairman, along with this portion I would like to refer the Board and counsel to Exhibit No. 15, the summary table that was introduced by Mr. Clare, which indicates--

MR. SAMSON: What page, Mr. Edelman?

MR. EDELMAN: These pages are not numbered. Exhibit 15 and it is entitled "Summary Table, Estimate of Municipal and Industrial Waste Discharges, Metropolitan Kansas City". I think it is the last two pages of this document.

MR. SAMSON: Very well. Go ahead.

MR. EDELMAN: Which does indicate a separate tabulation for the Fairfax Industrial District and indicates that Turkey Creek "not included in K.C.K. totals". I think presents a more precise breakdown than Mr. Clare's figures indicate--I mean than Mr. Kittrell's figures indicate.

CHAIRMAN WILSON: You are simply calling attention of us to the exhibit?

MR. EDELMAN: Yes.

CHAIRMAN WILSON: I think it is quite evident here that somebody, either the government or the cities or someone else who has the definite information, should establish the political organization and responsibility of all these component areas. We have already had some testimony on that, but we want to be sure that the Board has definite information of it before we conclude here.

MR. EDELMAN: Mr. Chairman, again I would like to point out that page 1 of Government Exhibit No. 15 indicates that the outlets that are involved in the Fairfax Drainage District are owned by the Fairfax Drainage District.

CHAIRMAN WILSON: We haven't had any very positive information of just what kind of an animal the Fairfax Drainage District is. Is it a political corporation organized under the laws of Kansas for some specific purpose or does it have the general powers of a municipality or a rural township or what?

MR. STEIN: Mr. Chairman, we have listed each party we considered responsible for wastes in the notice of the hearing. The character of the parties, whether industries or districts, was not particularly outelined at the hearing because we considered either they were political subdivisions of a state or an industry and that was so listed.

If we may, for purposes of clarification here, I think Mr. Clare's testimony related to the amounts coming from each district. Mr. Kittrell's testimony, as I understand it, relates to studies done in the stream where the material is mixed from all districts. Therefore, that has the--it is co-mixed and you have a composite picture there. I think we again will have to refer to Government Exhibit No. 15 for the government's breakdown of our estimate of what is coming from each of the parties named. I think the notice of the hearing indicates the character of those parties and we consider those parties set forth as being specifically responsible.

MR. SAMSON: I think the question that Mr. Brenneisen has raised here, he wants a breakdown as to what is coming from where. Isn't that right?

MR. BRENNEISEN: Well, I am afraid the Board is getting the impression that this waste is all coming from Kansas City, Kansas. I am not contending that we are not contributing waste, but I don't want you to get the idea that all this Kansas waste is from Kansas City, Kansas.

MR. SAMSON: I can only speak for myself and I don't have that impression.

MR. BRENNEISEN: Well, that is all right.

CHAIRMAN WILSON: I think we can clear that up. But the uncertainty still remains as to the governmental or political character of these units. Evidently there is some kind of a governmental or political unit as to the Fairfax Industrial District, but we still need to know what the powers of that unit are. Now, unquestionably these areas are included in some school district, but you wouldn't claim that the school district was responsible for dealing with the pollution unless you were charging the school district with sewage discharge from a school.

MR. STEIN: That is correct.

CHAIRMAN WILSON: Now, therefore, I still say that the Board would like to have some information as to the legal status of these districts outside of the cities. I am assuming, of course, that we may take it for granted that these two cities are municipal corporations of their respective states.

MR. BRENNEISEN: If the Chairman please, I wouldn't suggest it in a judicial hearing, but in this would you want me to explain my idea of it very shortly?

CHAIRMAN WILSON: Well, we would be very glad to. I think this would be an appropriate time to do that.

MR. BRENNEISEN: Any objection?

CHAIRMAN WILSON: As long as we are discussing the subject.

MR. BRENNEISEN: Kansas City, Kansas, is a separate city, separate entity. The Fairfax Drainage District is partly outside of Kansas City, Kansas, and--

CHAIRMAN WILSON: Now, is that a drainage district?

MR. BRENNEISEN: It is a drainage district.

CHAIRMAN WILSON: It is named here on the map as an industrial district.

MR. BRENNEISEN: The industries in that district have an association that I don't believe has any political significance, but there is a Fairfax Drainage District that has authority under law to operate, maintain and operate sewers. And that is mostly outside the city. There is a small part of it inside the city.

CHAIRMAN WILSON: Was that organization named in the notice as drainage district or industrial district?

MR. STEIN: Drainage district.

CHAIRMAN WILSON: And you say that is their correct corporate name?

Mr. Brenneisen: That is right. You also have named in the notice the Kaw Valley Drainage District. The Kaw Valley Drainage District is another district that is partly inside Kansas City, Kansas, and partly outside the City of Kansas City, Kansas. That drainage district does not maintain sewers.

CHAIRMAN WILSON: But the Fairfax Drainage District does?

MR. BRENNEISEN: But the Fairfax does, yes.

Now, then, also outside of Kansas City, Kansas, and included in our over-all sewage disposal from Kansas are about four townships. They were not named and they are very heavy contributors to this pollution, and Johnson County is also a contributor to this pollution and they were not named. They are heavily-populated districts that have not been incorporated as cities but have sewer districts and contribute.

MR. RIDGE: May I ask a question? You say both county and township?

MR. BRENNEISEN: Johnson County--and I am not sure whether--I believe the Johnson County is a sewer district, isn't it?

MR. HODGKINSON: Yes.

MR. BRENNEISEN: In Johnson, it is not the county itself, it is a sewer district in Johnson County; and then these other four townships are in Wyandotte County, that is the same county that Kansas City, Kansas, is in.

MR. RIDGE: Does a township ordinarily have sewage reponsibilities?

MR. BRENNEISEN: Yes.

MR. RIDGE: Unless there is a special district?

MR. BRENNEISEN: The townships are not in a district where it is necessary to have a drainage district. The drainage district was primarily set up by law to protect--for flood protection. In this case they gave them authority to also maintain sewers.

CHAIRMAN WILSON: In those cases where a drainage district is partly located within the City of Kansas City, Kansas, which of the two units would have responsibility for domestic sewage disposal?

MR. BRENNEISEN: That is a question we do not know the legal answer to.

CHAIRMAN WILSON: But at any rate, does the City of Kansas City, Kansas, have sewers that extend into that portion?

MR. BRENNEISEN: We have part of our sewer system which goes through the drainage district of the Fairfax Drainage District.

CHAIRMAN WILSON: As to such sewers, you wouldn't question the responsibility of the city?

MR. BRENNEISEN: That sewer was constructed by a contract between the City of Kansas City, Kansas, and the Fairfax Drainage District and the contract was contested in the Supreme Court and the Supreme Court held that the city and the drainage district did have authority to make that contract to build it together.

MR. STEIN: For clarification--pardon me.

CHAIRMAN WILSON: So that there won't be any undue emphasis put on that question--

MR. BRENNEISEN: As far as the city is concerned, we won't.

CHAIRMAN WILSON: --the City of Kansas City, Kansas, won't claim that it is relieved of any responsibility for the maintenance of the sewer--the city wouldn't claim to be relieved of responsibility for the sewage discharged through its outlets into these waters by reason of the fact that a small part of the sewage might have originated in one of these drainage districts?

MR. BRENNEISEN: No, sir. No, sir.

CHAIRMAN WILSON: Very well. Thank you.

MR. POOLE: May I ask a question?

CHAIRMAN WILSON: Yes.

MR. POOLE: I am still a little confused, Mr. Kittrell, as to the origin of your figures. I have Mr. Clare's here, which was in Exhibit 15, and he testified yesterday that they were a composite of figures that were in the reports of the consulting engineers to some of these various entities plus the figures that were in the reports of the Public Health Service through their investigations. I notice there is considerable variance between some of the figures in the summary table in Exhibit 15 and some of these that you have given us. How did you arrive at your figures?

A. I obtained information both from the regional office and used the data that we obtained on Turkey Creek Sewer. This is the only sewer that we sampled. And we did use the information we obtained from Turkey Creek Sewer. The other information was obtained from the regional office some time ago. It was necessary, in order for me to complete computations and charts, to have figures, say, by the end of April and it is possible that there may have been some changes in the tabulations since I received the original information on sources of waste. Where there are differences I would expect that the more recent tabulation, which is the one you have there, probably is the more accurate.

MR. POOLE: In other words, Exhibit 15, as far as you know, contains the more recent tabulation?

A. Yes, that is correct.

MR. POOLE: One noted example is that Exhibit 15 has a sewered population of 125,000 for the Kansas areas and the notes I got down from your testimony was 184,200.

A. I can explain this. I have an allowance in that 184,000 for the sewered population equivalent of the packing house wastes as sources of bacterial contamination.

MR. POOLE: All right, we have it clear now.

MR. RIDGE: I still want to get the figures again.

CHAIRMAN WILSON: Are there any further questions?

MR. SAMSON: Yes, he has a matter to clear up.

CHAIRMAN WILSON: Now, we don't want to go too far with detailed cross-examination. We sort of interrupted counsel's examination here and I don't want to go any further with that than necessary to clarify this matter of the composition of the district and organization. If there are further questions about the details of the witness's technical testimony, I suggest that we let the government proceed to develop that and then reserve questions for cross-examination.

MR. RIDGE: I am just asking to have the figures read again we originally started out with.

CHAIRMAN WILSON: Oh, very well. If there is some figure you would like to have again, go ahead and give that, Mr. Kittrell.

A. Do you want all the figures starting at the beginning again?

MR. RIDGE: The first group.

A. That is the sewered population equivalents. The total from Kansas City, Kansas, 184,200, of which 143,200 are discharged to the Kansas River and 41,000 are discharged to the Missouri River. From Kansas City, Missouri, the total 533,100, of which 110,000 discharges to the Kansas River, 423,100 to other streams.

MR. RIDGE: That clears it up.

Q. (By Mr. Edelman) Mr. Kittrell, you have in your testimony yesterday described the river sampling study that was made during October. Did you make another study in December of 1959?

A. Yes, during the period December 7 through 20, 1959.

Q. Can you tell us where the sampling stations for this study were set up?

A. Yes.

Q. You will refer to Government Exhibit No. 54.

A. Yes.

Q. Will you please describe the location of the sampling stations you used for the December 1959 survey?

A. On the main river we had a station at Kansas City, Kansas, water plant above Kansas City Metropolitan Area (indicating)--

Q. You are indicating a green circle?

A. This is a blue circle. This was used in both surveys.

Q. All right.

A. We had a new station on the main river at Napoleon, a third one at Jefferson City, which also was used during the October survey, and one at the St. Louis City Howard Bend Water Plant, which also was used in the earlier study. In addition we had a station located on the Kansas River at Lawrence, Kansas, water plant and one on the Osage River at the Bagnell Dam.

Q. Were the samples that were collected at these stations analyzed and evaluated?

A. Yes.

Q. Did you prepare a chart visually representing the statistical results of this analysis and evaluation?

A. Yes, I have such a chart.

MR. EDELMAN: May we have it, please?

I offer this chart bearing the legend "Bacterial Contamination of River - December 1959".

CHAIRMAN WILSON: What number is that?

MR. EDELMAN: It is Government Exhibit No. 58 for identification.

(Government's Exhibit No. 58 marked for identification.)

CHAIRMAN WILSON: And you offer it in evidence?

MR. EDELMAN: Yes, sir.

CHAIRMAN WILSON: Any objection?

Hearing none, it will be received.

(Government's Exhibit No. 58 received in evidence.)

Q. (By Mr. Edelman) Will you please tell us what this analysis and evaluation showed? And you may use this chart to indicate.

A. This chart is similar to the one prepared for the October study. At the bottom we have numbers which indicate the numbers of hours of time of water travel from the Kansas City Water Plant intake down to the mouth of the river.

MR. SAMSON: Mr. Kittrell, pardon me, would you move that chair so that we can see the entire exhibit?

Thank you very much.

A. On the left side of the chart we have figures indicating coliform bacteria per hundred milliliters in thousands. During the December survey the average mpn per hundred milliliters at the Kansas City Water Plant intake above Kansas was 30,000. At Napoleon the average mpn was 96,700, at Jefferson City the average was 11,200, and at the St. Louis Water Works intake the average was 6,960.

Q. (By Mr. Edelman) Did you compute a value for Lexington on that chart? Is Lexington indicated there, Mr. Kittrell?

A. Yes, we have indicated the high point on the curve at Lexington as we found it during our October survey and we believe that is where it occurred during the December survey, and the point shown at the top of the curve here (indicating) is a computed value based on our knowledge of sewered population and on the flow of the river during the December survey. This is a value of 157,000.

Q. Mr. Kittrell, are these values representative of the year-round concentration you would expect to find in the Kansas River or would they vary from season to season?

A. There would be a variation from season to season. In general, the multiplication of the bacteria is less during cold weather, the multiplication in the river after discharge to the river is less in the winter than it is in the summer. Both of our studies, the one in late October and the one in November, were at temperatures which were typical of winter conditions in so far as multiplication of bacteria in the river are concerned. Temperatures were less than 15 degrees for both studies.

Q. Fahrenheit or centigrade?

A. That is centigrade, 15 degrees centigrade. During the summer we may expect multiplication of bacteria in the river with higher temperatures which are four times as great, approximately four times as great, as in winter. During the summer, however, the flow of the river is approximately double what it was during our December survey. So that at the higher flows, say in June, July, possibly August, we might expect about twice the increase in coliform mpn's below the metropolitan area that we found during the winter study.

Q. Would such an increase during the warm weather, Mr. Kittrell, be in any way related to the existence of a potential health hazard increase?

A. I would expect the potential health hazard to be increased approximately in proportion to the increased coliform level.

Q. Can you tell us the basis for that opinion?

A. Well, it is our opinion that generally the pathogenic bacteria follow about the same pattern as the coliform bacteria. Therefore, as the coliform bacteria increase we believe that the pathogenic bacteria increase in rough proportion to the coliform increase.

Q. Mr. Kittrell, yesterday there was some mention of the possibility of silt and other non-organic materials affecting the measurements. Have you computed the weight of feces in pounds that is discharged from the area you have described of the Kansas Cities Metropolitan Area into the Missouri River and its tributaries here?

A. Yes, I have.

Q. Can you tell us what that weight is in pounds?

A. That is about 200,000 pounds per day or roughly 100 tons per day of feces.

MR. SAMSON: That comes from what area, Mr. Kittrell?

A. The entire Kansas Cities Metropolitan Area as I have defined it.

MR. SAMSON: What was that figure, a hundred--

A. About 100 tons per day or 200,000 pounds.

Q. (By Mr. Edelman) These are human feces you are describing?

A. That is right, yes.

Q. There is no allowance for stockyard wastes in that figure?

A. No.

Q. Have you computed the amount of human urine in gallons that enters the Missouri River and its tributaries in this area from the Kansas Cities Metropolitan Area as you have described the metropolitan area earlier this morning?

A. Yes.

Q. What is that figure?

A. That is about 180,000 gallons per day.

Q. Mr. Kittrell, based on the coliform levels and the other information you have given us in your testimony, do you consider that the reach of the Missouri River from Kansas City, Kansas, downstream to St. Louis represents a health hazard or constitutes a potential health hazard to persons who use the river and come into contact with the raw water?

A. Yes, I do.

Q. I would like to refer again to Government Exhibit No. 58. I notice you have two dashed lines, one a red or orange broken line.

A. Yes.

Q. And I don't know, I can't see the color of the other.

A. I believe that is purple.

Q. Purple. What are those lines?

A. These are similar lines to those which I described on the chart for the October study, indicating the continuing death rate downstream or the die-away of coliforms from the metropolitan area and above for the yellow line. The purple line describes the computed death rate or die-away of coliform bacteria from above the Kansas City Metropolitan Area. By difference again we can compute the contribution of various areas in the Metropolitan area to the difference between these two lines.

MR. EDELMAN: Thank you. We have no further questions on direct, Mr. Chairman.

CHAIRMAN WILSON: Cross-examination by counsel?

MR. KOENIGSDORF: If you please.

CROSS-EXAMINATION

BY MR. KOENIGSDORF:

Q. Mr. Kittrell, have you, sir, in your studies or experience ever found a case of illness arising by reason of drinking water from the Kansas River at a point below Turkey Creek?

A. I have not in my own personal experience, no.

Q. Have you ever found any illness to individuals by reason of boating, swimming, fishing, eating fish, or any other water source in this particular area?

A. I did talk to one man who believed that he had gotten sick from, as I recall it, water that was in a can at one of the dumps that he thought had come from the river. Now, this is more or less hearsay evidence, but to answer your question fully, one man that I have talked to thought he had such illness.

Q. And you would not consider that very substantial evidence, would you, that the man had become ill? He took a can from a dump that he thought had come from the Missouri River and got ill because of that?

A. I don't recall the exact circumstances, but--

Q. You would say, really, that you don't know of any case where anyone has become ill by reason of any source from this particular Kansas River area?

A. Well, I couldn't say that I do or that I don't.

Q. If you do, sir, I would like to know. If you do know, tell me. And if you don't, I would appreciate--

A. This is the only occasion that I am familiar with that might have that possibility.

Q. Would you swim in the Kansas River at Bonner Springs?

A. No, I would not.

Q. What was your coliform count at Bonner Springs?

A. On which study are you referring to?

Q. Well, give me either one, I remember some hundred and some-odd thousand figure. I don't know if I am right or not.

A. On one occasion I think we got 45,000 and another something like--let me refer to my figures here.

MR. EDELMAN: That is the study of November 1 to 7, 1959, Mr. Kittrell, you testified to in Bonner Springs.

A. I see. You were referring to the study of the Kansas River rather than our other studies of the Missouri River where we did also sample the Kansas River? You are referring to the study of the Kansas?

Q. (By Mr. Koenigsdorf) I am referring to the sample you made at Bonner Springs, sir, as a coliform count.

A. Yes. That was something like 119,000 per hundred milliliters, that is correct.

Q. Now, sir, would you use that water for--is that considered above standard for drinking purposes?

A. Well, I don't think that is comparable to our drinking water standards.

Q. It is not?

A. I mean--

Q. What is the distinction on that, sir?

A. Well, water for drinking, we recommend a limit not in excess of about one coliform per hundred milliliters.

Q. Now, is that, then, within the standard? I have heard this figure 5,000. Is there some other standard now?

A. This is for a source of water supply to be treated. We do not call this drinking water.

Q. Well, let's assume, then, that this is a source of supply at Bonner Springs to be treated. Would you consider that water suitable?

A. I would not consider it desirable as a source of water supply for treatment for municipal purposes.

Q. And for recreational purposes would you consider the water at Bonner Springs suitable?

A. Not during the time we sampled, no.

Q. Is there a variation in time, sir?

A. It varies from time to time, yes.

Q. With a hundred and some-odd thousand at the time you sampled, do you think that at any time it would go down, ordinarily, to your standards?

A. I don't believe I can answer that question, there are so many factors involved. It is possible that it might. I can't say.

Q. Well, now, sir, if there were no sewage, then, disposed into the Kansas River at Turkey Creek or below, would you say, sir, that the water in that area would be suitable for recreational purposes or drinking water source or swimming?

A. I did not attempt to make calculations which would indicate whether it would be or not on the basis of the data I have.

Q. Mr. Kittrell, you have estimated many things and I would say that quite a number of these things are estimates. Could you give me your best estimate as to whether that would be a suitable source of water for recreation or a suitable water for recreation and drinking purposes?

A. My best estimate would be that the coliform that we found at Turner Bridge would not reduce to 5,000 per hundred by the time the river reached the mouth of the river.

Q. So it still would not be suitable for that purpose if no sewage were put into the Kansas River from Turkey Creek, including Turkey Creek, and on down to the mouth of the Kansas River?

A. According to the estimate that I have just given.

Q. Now, sir, this coliform that we have been talking about, that is a bacteria, did I understand you to say?

A. That is correct.

Q. Is that a pathogenic bacteria?

A. Not in general. A very small section of the group of coliform bacteria is pathogenic, but most of the coliforms are not.

Q. Is coliform count in and of itself an indication that the water is not fit for certain purposes, I mean because of the presence of the coliform would that make it fit or unfit for drinking or recreational use?

A. Would you repeat that question, please?

Q. If the only thing you found in the water were this coliform bacteria in the count you have indicated, would that prevent or be a reason not to use it for drinking purposes or recreational purposes?

MR. EDELMAN: Mr. Chairman, I wish counsel would indicate the environment that this water is in. Are you talking about water in the Missouri River or in a mountain stream?

MR KOENIGSDORF: We are talking about certain standards that have been set and about certain coliform count of 5,000.

Q. (By Mr. Koenigsdorf) If you found 100,000 coliform in water and nothing else along with it, would that water be a suitable source for water treatment?

A. I believe that objective is stated as coliform organisms associated with sewage pollution and we do not interpret the results of coliform bacteria without a knowledge of the surrounding area, without a sanitary survey. The mere presence of a certain number of coliform organisms without some knowledge of upstream factors is not interpretable.

Q. I think you have answered my question, that coliform in and of itself is not the thing that you are worrying about, coliform bacteria?

A. The coliform bacteria are an indicator organism and when associated with sewage pollution are an indication of the probable presence of pathogenic bacteria.

Q. I think we agree. Coliform in and of itself is not--

A. I can't say that fully because, as I said, a small portion of the coliform group of bacteria are pathogenic.

Q. What would that be, sir?

A. I am not a bacteriologist, sir, and I could not specify the particular individuals of the coliform group which are pathogenic. There are some, as Dr. Kabler testified yesterday, which can cause gastrointestinal upsets, especially in young children.

Q. Well, I think we ought to be frank with each other. On this young children business, did you ever hear of a doctor anywhere in the country that didn't recommend boiling of water for a young infant, regardless of sewage treatment or water treatment?

A. I can't recall whether I have or have not. It is something I have not paid a lot of attention to.

Q. Now, sir, you have testified this is a dangerous condition existing, have you not?

A. Yes.

Q. You say now you are not a biochemist or not familiar with all these organisms. You did sample this water. I think we ought to really bring this thing out on the table and I am going to ask you to do it, sir. The facts should be presented. If we are living in a dangerous condition or if we are holding a water gun filled with germs at the head of our neighbors down the river, I think we ought to know about it. All I have heard is coliform and I would like to know, and I think we are entitled to know, what other pathogenic or what pathogenic organisms you found in your sampling.

MR. EDELMAN: Mr. Chairman, there is no indication that the witness sampled for pathogenic organisms. There has been no testimony to that effect.

MR. KOENIGSDORF: Well, Mr.--

CHAIRMAN WILSON: Well, just a minute, counsel. I am going to let the witness answer the question as far as he admits knowledge. The Board, of course, will take all the testimony into consideration.

Q. (By Mr. Koenigsdorf) Pathogenic organisms, as I understand it, are those which would cause or might tend to cause illness in humans, and I think we ought to know it if you found or searched for such.

A. We did not search for such organisms.

Q. Why would you not search for such organisms as that, Mr. Kittrell?

A. Because they are extremely difficult to recover from water by laboratory methods. That is the reason that we use an indicator organism rather than determination of the pathogenic organisms themselves.

Q. Do you have complete laboratory facilities?

A. Yes.

Q. It is possible to isolate a great number of these so-called germs, is it not, with laboratory tests?

A. Which type of germs do you mean?

Q. Well, any pathogenic germs that are found in water.

A. It is not easily done in the laboratory, no.

Q. Is it capable of being done in the laboratory?

A. It has been done on some occasions in polluted water, yes.

Q. Would your laboratory be equipped to so determine these organisms?

A. Yes, certainly our bacteriological laboratories could make such determinations if they can be made in the concentration present in the river.

Q. But you didn't feel it was important enough to find if there were typhoid virus, or whatever it is that causes typhoid, or infectious hepatitis or any of these things that affect human beings in your analysis?

A. No, because past experience has indicated that where there are coliform organisms of the levels that we are dealing with that pathogens invariably are present, and although we might have attempted to determine the presence of pathogenic bacteria, our failure to recover them from water would not have proved their absence.

Q. In other words, you didn't do it?

A. That is right.

Q. Now, that is at no place on the Kansas River in these samplings did you test for pathogenic organisms?

A. I did not, no.

Q. Nor did anyone else whose reports you have received?

A. No.

Q. You mentioned that one season your coliform count was up so high because of surface runoff that you didn't use it as an example. What coliform count would run into the Kansas River on a heavy rain between Bonner Springs and the mouth of the Kansas River?

A. I do not have enough data to answer that question.

Q. Well, your best estimate, sir. Would it exceed 5,000 by the time it got to the mouth of the Kansas River?

A. I do not have enough information to answer that question. I am sorry.

Q. You made one test that you threw out because it had a high coliform count from runoff. How high was that above your other tests that you used?

A. Well, there was more than one test that we threw out. We threw out data for three days, for example, at some of the points, for four days at other points where we were sampling around the clock, in other words eight samples per day for three to four days.

Q. With those tests you cannot give me an estimate as to what the coliform count increase would be by reason of runoff, is that correct, sir?

A. I can give you the data for the increase that we found during this one particular time on the Missouri River. The data is not in such form that we could determine this on the Kansas River. We did not have around-the-clock sampling for twenty-four hours per day on the Kansas River above the metropolitan area. I could give you the figures of that nature for the Missouri itself at various stations.

Q. I am interested right now in the Kansas River, sir. Mr. Kittrell, do you know what the authorized or allowable coliform count is in effluent from oxidation basins?

A. I don't know of anyone who has established such an allowable level.

Q. Have you tested any?

A. I did on one occasion in Oklahoma, yes.

Q. What did that run, sir?

A. I don't have the data with me and I cannot recall specifically.

Q. Would you say it was over a million?

A. My recollection, if that is useful, is that is was something less than a million, possibly in the neighborhood of 100,000, though I cannot be sure of this.

Q. You have reports with you that you have used on arriving at many figures. Would you have any that would show what the allowable is or what has been the average in the coliform count in the effluent from these oxidation basins?

A. I am not aware of any such figure.

Q. These standards that we have talked about, is there any standard set by the federal government or the act that this hearing is held under, to your knowledge?

A. That is a rather broad question. Could you be more specific? With respect to what?

Q. Let me preface it. I believe you stated yesterday that these standards were set by state compacts of some kind, is that correct or not?

A. I don't believe it is called a state compact. There is a group of states on the Missouri Valley which have, I presume more or less informally, I don't believe there is any legal agreement, I think it is an informal agreement, the Missouri Basin Valley states have adopted objectives for water quality.

Q. Is there any standard that is set by this act, as far as you know, that we are appearing under, the Federal Water Pollution Control Act?

A. I am not a lawyer, but I am not aware of a standard in the act itself. I think our lawyers could answer this far better than I can.

MR. STEIN: Mr. Chairman, we would have to interpose here. He is asking the witness a legal conclusion and this is a question in the act of whether there is a legislative standard. I don't believe this witness is qualified to answer that question.

MR. POWERS: Well, what do you say, Mr. Counsel?

CHAIRMAN WILSON: I think it is obvious, the witness has answered as far as he knows. The answer may stand for what it is worth.

Q. (By Mr. Koenigsdorf) Is there any standard that--excuse me.

MR. KOENIGSDORF: Did you want to ask something?

MR. POWERS. I was going to ask counsel if he will admit, therefore, that the Federal Act doesn't set any standard?

MR. STEIN: If you are taking the rather unusual course of asking opposing counsel to comment on the state of domestic law, I will be glad to answer it. I certainly do agree there is a legislative standard in the act which was very carefully drawn.

CHAIRMAN WILSON: I might observe that the act speaks for itself and the Board is familiar with it.

Q. (By Mr. Koenigsdorf) Well, now, sir, let me get back. You said something about a 5,000 standard for drinking water, the source of treatment for drinking water. Where does that come from, sir?

A. That is a recommendation of the U. S. Public Health Service originally. It was recommended that the average monthly coliform bacteria associated with sewage pollution not exceed 5,000 per hundred for water plants having certain types of treatment.

Q. Do you agree with that standard?

A. Yes.

Q. Do you say 10,000 would be too high?

A. I believe it would.

Q. 6,000?

A. You are getting pretty close to 5,000 when you say 6,000.

Q. It is an arbitrary figure, that is the point I am making. How do you arrive at such a standard?

A. I did not arrive at the standard myself. It has been generally accepted for many years by the sanitary engineering profession.

Q. Now, by the sanitary engineering profession, did you say, it has been recognized?

A. Yes.

Q. I am not going to get into a debate with you on that. Is there an industrial standard set?

A. Industrial standard for what?

Q. Industrial standard. We have industries here. Is there an industrial standard set?

A. Well, your question is so broad I cannot answer it. I don't know just what you are trying to--what you are asking. I don't understand what you--

Q. Well, do these standards vary from river to river?

MR. EDELMAN: Mr. Chairman, I think the witness is being confused by the counsel's use of the term standard when he is talking about objectives.

MR. KOENIGSDORF: Well, say I am confused and I am just trying to get straightened out as to just what standards we are using on these things.

CHAIRMAN WILSON: I think counsel's questions are proper cross-examination. You may proceed.

MR. KOENIGSDORF: Thank you.

Q. (By Mr. Koenigsdorf) Are these standards set by different standards in different parts of the country?

A. Well, generally objectives for water criteria or standards, whatever they are called, for streams are established by the various states themselves.

Q. So they might differ in different parts of the country?

A. That is correct.

Q. An industry that has a plant in Ohio would come here and have a different standard in Missouri?

A. That is possible.

Q. Do you follow the state standards when you go from area to area?

A. We compare our results with the states' objectives if they have such objectives.

Q. Do you adopt their objectives if they do have them as the standard that you require under the Public Health Service?

A. We do not require treatment to meet any particular objective. We leave this up to the states.

Q. Objective is the same thing as standard, isn't it?

A. It depends on how it is described in the state regulations. Some call it standard, some objective, some criteria.

Q. I believe you would answer my question that you do follow the state standards, then?

A. Yes.

Q. And the differ from area to area in the country?

A. That is right.

Q. I asked yesterday about chloroform sampling solution and I believe I was advised that you had made the tests, is that correct, sir, on the chloroform solubles, or am I wrong on that?

A. No, we did some of the sampling for some of the carbon filter work, our field crew did some of the sampling.

Q. You heard Mr. Clare testify on this chloroform soluble sampling that he didn't do it but someone else would explain how it was done. You didn't make the sampling?

A. No, I did not do that.

Q. Now, sir, I want to ask you, in your search on the Kansas River in your study you stated that the only sewer that you were asked to test was Turkey Creek, the only sewer outfall?

A. Yes.

Q. I am not sensitive, but do you know why Kansas City, Missouri, is picked out as the only one of all these sewers that you tested in going down this river?

A. That was a source of interstate pollution that we were interested in.

Q. Are ther other--well, I won't ask you. But that was a source of interstate pollution?

A. Yes.

Q. In your opinion. I am not going to fight with my good friends over here. Did you see anything else going up and down the river you thought maybe should be sampled?

A. No, we do not normally consider it necessary to sample sources of sewage where we can measure and differentiate in the stream itself. We normally sample and measure and differentiate within the stream itself rather than attempting to do it at the mouths of sewers.

Q. I understood you to say that you made these many estimates because it was difficult to test in the water and arrive at the source as to where this pollution came from, is that correct or not?

A. I don't recall that particular statement.

Q. Is it possible to measure accurately in the river itself near an outlet the pollution that that outlet contributes?

A. You can measure the effects at that particular point of that pollution, yes.

Q. You measured right above Turkey Creek, did you not?

A. Yes.

Q. And you sampled again at the mouth of Turkey Creek?

A. Yes.

Q. Did you sample right below Turkey Creek?

A. No.

Q. Wouldn't that have been--

A. No station between the two that you mentioned.

Q. Wouldn't that have enabled you to give a more accurate statement to this Commission of the percentage of pollution that you say is in there?

A. It depends on how you are trying to measure. If you merely want to measure an effect in a limited area, in the immediate vicinity of a sewer where the pollution normally will be higher than it is downstream, if that is all you are interested in is getting the immediate effect, then you can sample and define that effect in the vicinity of the mouth of the sewer. However, if you are attempting to obtain the entire waste load carried by a stream, you need to measure results representative of the total stream flow and this is very difficult to do close to a source of pollution because of the lack of mixing. So it depends on what you are trying to determine how you go about sampling.

Q. You were trying to determine the percentage of pollution that goes into the Kansas River out of the Turkey Creek Sewer outfall, were you not?

A. No.

Q. Well, you have made those estimates to the Commission, have you not?

A. Yes.

Q. Would it not have been helpful to have measured below Turkey Creek to determine this more accurately?

A. It would have been desirable if possible. The river is not long enough to get complete mixing of all the wastes from the metropolitan area.

Q. You just can't hardly tell whose it is without guessing, then, can you?

A. You can't tell in the river at that particular point. You can tell by knowing the sources of wastes and where they come from.

CHAIRMAN WILSON: You are referring to the Kansas River?

A. Yes.

Q. (By Mr. Koenigsdorf) If I understood you correctly, yesterday you said that in arriving at your percentage of coliform contributed by the Turkey Creek outfall to the others that are in the Kansas River below that point you used rate of flow to determine the percentage, was that right?

A. No, I don't believe I said that.

Q. How did you arrive at that, then, sir?

A. At the coliform bacteria in Turkey Creek Sewer?

Q. Percentagewise. You showed the BOD's and the solids at a relative low percent and then this is bacterial contamination, if I have this correct here, and you went up to 40-some-odd percent. By bacterial contamination I assume you meant coliforms, is that correct?

A. Yes.

Q. How do you explain that difference on smaller percentages on BOD and suspended solids and then you jump up to this 40-some-odd percent on bacteria?

A. I am not sure I know what you are referring to.

Q. Well, Exhibits Nos. 50, 51 and 52, sir. Did you not in each of those determine a percentage that was attributable to Turkey Creek as compared with the other flow into that area?

A. Yes.

Q. And did you not state as to the suspended solids that it was, if my figure is right, 25.2 percent Missouri, not necessarily attributable to the creek but Missouri?

A. With respect to suspended solids 25 percent--

Q. Is that chart, Exhibit 50, on suspended solids?

A. No.

MR. POOLE: Yes.

A. Oh, yes, that is right, yes.

Q. (By Mr. Koenigsdorf) And what percentage did you say came from Missouri?

A. You will have to give me a minute to get my notes straightened out here again. Yes, that is right. I know what you are referring to now. Yes, 25.2 percent of the suspended solids load from Missouri, yes.

Q. Thank you, sir. Now, on BOD was 49--that is population equivalent. Where is your figure on BOD?

A. That is indicated on Exhibit 49 and the figure I have here is 26.7 percent of the BOD.

Q. That is right. Then we get to the bacterial contamination, which I assume is coli count, and what was your percentage on that?

A. From Missouri 43.4 percent is the figure I have.

Q. That is where I would like for you to explain to me as to why it jumps up there. How did you arrive at that?

A. That is based upon Missouri on the consultants' statement of sewered population tributary to Turkey Creek in Missouri, 110,000. For Kansas we have consultants' reports indicating that a total of 93,200 sewered population discharges from the Kansas area to the Kansas River, and in addition to that 93,000 I have computed an allowance of 50,000 equivalent sewered population for the bacterial contamination from the packing plants for a total of 143,200 or 56.6 percent from Kansas, 110,000 or 43.4 percent from Missouri.

Q. That 50,000 is an arbitrary figure that you selected?

A. Not altogether arbitrary, no. This is based on past experience with other packing houses, other packing house wastes, and the weight of live kill in the Kansas City area in relation to the live weight kill in these other areas where we have had experience.

Q. You still haven't answered my question as to the difference--

A. I am afraid I don't understand your question.

Q. I am just trying to figure out why this difference in the smaller percentage on BOD and solids and then up to this 43 plus percentage on coli.

A. Well, you do not necessarily expect your BOD population equivalent and your suspended solids population equivalent and your sewered population equivalent to agree because of the presence of industrial wastes in many sewers.

Q. That is what I want to find out. Because of industrial wastes. Now, in this area that we are referring to is there a great deal of industrial waste that flows into the Kansas River between Turkey Creek and the mouth of the Kansas River?

A. Yes, there is a considerable amount of industrial wastes.

Q. Primarily it is residential and commercial, is it not?

A. Of what area?

Q. When you use packing houses you are talking about a coliform-producing industry, are you not?

A. That is one of the constituents of their wastes.

Q. So other than packing house wastes do you have a great percentage of industrial waste in this area?

A. It depends on what constituents you are referring to. I don't know what constituents you want to relate this to.

Q. I am just trying to find out why this is 43.4 percent and the other is 25 percent.

A. Well, would you like for me to give you the entire table? Would this help you understand?

Q. Yes, I just want an answer.

A. I have already given you the table or the data on sewered population equivalents. You have that. And you would like to--

Q. You get that from weight of water, do you not?

A. And I explained how I arrived at this. Is that satisfactory?

Q. Yes.

A. Do you want the BOD population equivalent now broken down the same way? Will this be helpful?

Q. If you can answer my question as to why there is a difference in these percentages in any way that you wish, sir. Just explain to me why there is a difference.

A. I don't know how to answer it other than the way I have, that some industrial wastes affect the BOD and suspended solids population equivalents and they affect them in different ways because of the different types of industry involved. The bacterial population equivalent is based on two things, sewered population and the computed population equivalent from the packing houses. I see no reason to expect any figures of this sort to agree--I mean to be the same for each of these constituents.

Q. Well, it seemed to me that it would be closer, but I am not going to get into a big argument with you now about it because--

A. It can be almost any.

Q. --the Board is going to resolve it.

A. There can be any considered relation, I mean any selected relation among them, I mean depending upon the type of industry and the amount of sewage involved.

Q. It boils down to where it depends largely upon your own estimates of percentages?

A. No, it is based on the information that we got from the consulting engineers' reports and from our own work on Turkey Creek Sewer. It is not my own estimate, no.

Q. Did you ever observe the Kansas River at a standstill because of the Missouri River being high?

A. No, I have never seen it at a standstill.

Q. You stated that Mr. Pafford had indicated so and he said he had heard but never had seen it. You have never seen it either, is that correct?

A. No.

MR. KOENIGSDORF: Thank you.

CHAIRMAN WILSON: Does other counsel have any cross-examination?

Mr. Brenneisen.

CROSS-EXAMINATION

BY MR. BRENNEISEN:

Q. Mr. Kittrell, you testified that Kansas City, Kansas, had a sewered population equivalent of 184,200, I believe?

A. Yes.

Q. Is that figure based upon samples taken in the rivers?

A. No.

Q. It is not?

A. That is based again on the consulting engineers' report of sewered populations plus the allowance for bacterial contamination from the packing house wastes. This is what I call a sewered population equivalent as a source of bacterial contamination.

Q. Did they take tests in the river and the sewers, the consulting engineers take tests in the rivers and the sewers, to come to give you the figures that you used?

A. It is my understanding, though our regional office had the direct contact with the consulting engineers, it is my understanding that some of the sewers were sampled. I am not aware of any samples that were taken in the streams, but this is hearsay.

Q. This hearsay?

A. I did not have the direct dealings with the consultants myself.

Q. Do you know of your own knowledge whether or not that figure includes the sewers from Johnson County, from Quindaro Township, from Wyandotte Township, from Shawnee Township? Do you know of your own knowledge whether--

A. Our regional office could answer that.

Q. You don't know?

A. But it is my opinion that it does include all sewered population in what you might call the Kansas City, Kansas, Metropolitan Area.

Q. Yes.

A. It is my understanding.

Q. Everything down the river from the point on your chart at Turner, is that right? Is that your understanding?

A. Plus that going into the Missouri River, yes.

Q. Yes.

A. That is my understanding.

Q. And your charts that are exhibits here 49 to 58, from about Government Exhibit 49 to 58, those figures referring to Kansas City, Kansas, include sewage from downstream at Turner to the mouth of the Kaw and then in the Missouri River on the Kansas side?

A. The computations I made are based on that 184,000 as the sewered population equivalent, that is the computations for Kansas City, Kansas.

MR. BRENNEISEN: I believe that is all.

CHAIRMAN WILSON: Does any other counsel wish to cross-examine?

We will take our morning recess for ten minutes.

(RECESS)

CHAIRMAN WILSON: The hearing will come to order.

Proceed, Mr. Stein.

MR. STEIN: We have no redirect examination of Mr. Kittrell.

CHAIRMAN WILSON: Do any members of the Board have any questions to ask Mr. Kittrell?

MR. SAMSON: I have none, thank you.

Q (By Chairman Wilson) I have one or two of Mr. Kittrell. In reference to questions asked you by one of the counsel as to detailed tests that you made at sewer outlets, and so forth, I think it is quite obvious that in a large study of this kind you had to base your conclusions upon data that was obtained either from persons acting under your direction or from other sources on which you relied?

A. That is correct.

Q. I would just like to ask you one general question, whether in your professional opinion the data you used on which to base your conclusions were sufficient for that purpose.

A. Could I ask specifically, are you referring to some specific conclusion or you mean all of my conclusions?

Q. All of your conclusions.

A. Yes, I believe so.

Q. You base all of your conclusions, if not upon your own personal observations, upon data from sources which you considered reliable and sufficient for the purpose?

A. That is correct, yes.

Q. Would you take the pointer, please, and go to the air maps and first put up Exhibit 17, which is against the wall there, the one from the extreme northerly part of the stream. That shows the portion of the Missouri River starting from the north of the area that we are concerned with. If it is put up on top of Exhibit 18, it would fit right on there, wouldn't it? Well, don't put it up there.

MR. EDELMAN: We just want to help Mr. Kittrell.

Q. (By Chairman Wilson) That is where it would fit?

A. Yes.

Q. Just so we would have in mind what it indicates.

A. Yes.

MR. KOENIGSDORF: That is Fairfax Airport on there, isn't it, Mr. Chairman?

Q. (By Chairman Wilson) Now, there are indicated on that exhibit, as well as on Exhibit 14, the small map which we have that shows all the sewer and industrial waste outlets, certain outlets in that area which covers the portion of the Missouri River some distance north of the junction of the Kansas River. On the east side of the river there are three outlets, I believe, Nos. N-1, N-2 and N-3?

A. Yes.

Q. No. N-1 is an outlet below the municipal water plant, is it not?

A. That is my understanding, yes.

Q. What is it?

A. That is my understanding. I am not too familiar with all of the individual sewers in the area. That is what it appears to be on the map, yes.

Q. Well, you heard Mr. Clare's testimony, did you not, as to the character of those outlets?

A. I heard most of his testimony. I do not believe I heard all of it.

Q. And what comes out?

A. Pardon me?

Q. And, I say, the nature of the discharge from them?

A. In general I heard most of it, yes.

Q. And then I believe outlet N-2 is a sanitary sewer, is it not, from North Kansas City?

A. Yes.

Q. And N-3 is a storm water outlet from the airport, is it not, or the airport area?

A. Yes.

Q. Now, I would just like to ask you the general question, if you can answer it from your own observations or studies, as to whether these two outlets, aside from the sanitary sewer outlet N-2, make any significant contributionto the pollution of the waters that we are concerned with?

A. I do not have in mind the actual figures that Mr. Clare had on these particular outlets. If I had that table I could probably give you an answer.

Q. They are shown on this Exhibit 15 that we have here. Will you just look at the data with reference to the discharge of sewage or waste from those outlets on Exhibit 15. Am I right about that number?

MR. JOHNSON: Yes.

SECRETARY AYERS: Yes.

MR. KOENIGSDORF: What page are you referring to, Mr. Chairman?

MR. SAMSON: It is right in the middle of the exhibit, Mr. Koenigsdorf.

CHAIRMAN WILSON: It is in the page headed "North Kansas City Unit" of Exhibit 15.

MR. KOENIGSDORF: Thank you.

Q. (By Chairman Wilson) Do you have those data in mind now?

A. Yes, I have this now, yes.

Q. Assuming those data to be correct, can you now give us your opinion as to whether the discharge from these outlets N-1, that is the one below the water plant, or N-3, that is the storm water from the airport area, as to whether they make any significant contribution to the to the pollution of the outlet waters?

A. With respect to coliform bacteria, I do not believe that they would make a significant contribution except at times of heavy surface runoff, in which case they might carry considerable coliform bacteria.

Q. Now, when I ask you this question as to whether they are making a significant contribution, I mean with reference to any one of the types of tests that you have used on which to base your opinion, and if you wish to differentiate you may do so. Now, then, with reference to the sanitary sewer outlet from North Kansas N-2, what is your opinion as to whether or not that makes a significant contribution to the pollution of the outlet waters?

A. On the basis of the data here I would say that that would be a very insignificant source of pollution, on the basis of the data that we have here. I see no evidence of sewered population which would not affect the bacterial concentration. There is an indication of suspended solids and BOD which after dilution in the river would be very small and would not significantly affect BOD or dissolved oxygen.

Q. Let's be sure that you and I understand that we are talking about the same outlet. That is the outlet, is it not, from a sanitary sewer from North Kansas City?

A. Yes, that is N-2. And I am basing only on the figures that I see here on the chart because I am not familiar with that individual sewer as a source of waste in itself. I mean I considered the area primarily as a unit, and so I did not investigate the many individual sewers individually. But based on the data that I see here, my answer would still stand.

Q. Do I understand you to say that the sewage discharged through this outlet from North Kansas City is not, in your opinion, a significant contribution to the pollution of the outlet waters?

A. When you say the outlet do you mean of the sewer itself or do you mean the outlet--I am not sure just what you mean by the word "outlet".

Q. I mean the sewage discharged through this outlet which apparently originates in North Kansas City, Missouri, is that a significant contribution to the pollution of the outlet waters?

A. By the outlet do you mean--you don't mean after it enters the river? You mean at the mouth of the sewer itself? I am afraid I--

Q. I am going to follow this up by a further question. I mean at the mouth of the sewer itself, yes. The data here show the strength of that sewage, do they not?

A. Yes. Well, I would say that is a rather small source of sewage in so far as BOD and suspended solids are concerned.

Q. That is, it is a rather small source of--

A. Wastes.

Q. --pollution?

A. Yes.

Q. Now, then, calling your attention to the full width of that stream, what is your opinion as to whether or not the sewage entering the stream from North Kansas City through that outlet has any effect across the river in endeangering the health or welfare of persons in or from the State of Kansas using the Kansas side of the Missouri River below that outlet?

A. Well, based on the figures here, which do not indicate sewered population, any sewered population, my answer to that would be no.

Q. Well, do you have any other information as to sewage discharge originating in the City of North Kansas City, Missouri, that would indicate any effect endangering the health or welfare of persons on the Kansas side of the Missouri River below those outlets?

A. I would have to refer to my-- You are talking about all sewers from North Kansas City?

Q. All sewers from North Kansas City.

A. I see.

Q. Now, According to the maps that have been offered in evidence here, there are only these three outlets from which there might come any discharge that would affect the portion of the Missouri River which lies within the boundaries of the State of Kansas. Bear in mind that I am not asking you now about any discharge from North Kansas City, Missouri, that enters the stream below the state line or on the Missouri side of the state line. I am inquiring only as to the possible effect of the discharge of sewage from North Kansas City, Missouri, that might have an effect in endangering health or welfare on the Kansas side of the Missouri River.

A. And related to these three sewers? I mean you are limiting your question to these three sewers?

Q. Those three sewers--

A. I see.

Q. --or any other sewers that you know of originating in North Kansas City, Missouri.

A. I see. Well, this tabulation does not indicate any sewered population, so I am not aware of any sewered population in the area discharging within this reach or the river.

Q. Then as far as your knowledge extends, you know of none?

A. That is correct.

Q. Now, then, if you will please, take Exhibit 17 out of the way and return to the larger serial map, Exhibit 18. Now, if you will just take your pointer and put that at the Turkey Creek outlet.

A. (Indicating)

Q. What is your opinion as to whether or not the sewage entering the Kansas River through the Turkey Creek outlet--this may be repetition, but I want to make sure that we understand your opinion--as to whether or not the sewage entering the Kansas River from the Turkey Creek outlet originating within Kansas City, Missouri, makes a significant contribution to the pollution of that stream which endangers the health or welfare of persons in the State of Kansas. What is your opinion on that question?

A. It is my opinion that it does.

Q. And what is your opinion with reference to the sewage entering the Kansas River from the outlets below Turkey Creek which have already been described in the testimony, those are industrial outlets a part of which originate within Kansas City, Missouri, what is your opinion as to whether the portion of the wastes or sewage discharged from those outlets makes a significant contribution to the pollution of the Kansas River that endangers the health or welfare of persons in the State of Kansas?

A. Now are you referring to all other sewers?

Q. All other sewers--

A. From all sources?

Q --below Turkey Creek.

A. Below Turkey Creek? Yes.

Q. Particularly the portions of the sewage or waste originating in Missouri.

A. Other than Turkey Creek?

Q. Other than Turkey Creek, yes, below Turkey Creek.

A. Well, until yesterday I was not aware that there were any other sewers from Kansas City, Missouri, discharging into the Kansas River.

Q. The testimony shows, I believe, that those are all industrial waste outlets from the stockyards or other areas which overlie the state line, so that a part of the waste that is discharged through those outlets originates in Kansas City, Missouri, and part originates in Kansas City, Kansas. Well, do you have enough information on which to base an opinion as to whether the part of that sewage or waste originating on the Missouri side of the line makes a significant contribution to the pollution of the Kansas River for the purposes that I stated?

A. Well, from the data listed in--what is this, Government Exhibit 15?

Q. Yes.

A. --in Government Exhibit 15 and on the basis of Mr. Clare's testimony with respect to those particular sewers, I would not believe that the contribution from Kansas City, Missouri, would be significant in the over-all picture.

Q. Now, then, if you will put your pointer where the state line enters the Missouri--

MR. SAMSON: What is the answer to that last question?

MR. RIDGE: Let's have the answer to that last question again.

A. My opinion is that the Missouri or Kansas City, Missouri, contribution to these sewers, some of which apparently arise in Missouri and flow--pass through the stockyards in Kansas and thence to the Kansas River, it is my opinion that they are not a significant portion of the effect as related to wastes from the entire area.

Q. (By Chairman Wilson) Then the net result of your opinion is that whatever significant contribution is made to the pollution of the Kansas River endangering the health or welfare of persons in Kansas that arises in Missouri, it is confined to what is discharged through the Turkey Creek outlet?

A. I would say primarily so, yes. I trust you are not asking me for a legal opinion. I mean from a technical standpoint I would say that this contribution that you are referring to is an extremely minor one and in itself would not endanger health and welfare.

Q. We are asking you for your professional opinion.

A. I see. Yes. Well, my answer would be--

Q. Now from the legal standpoint.

A. Yes. My answer would be that they would not constitute a hazard to health and welfare.

MR. JOHNSON: Other than Turkey Creek?

Q. (By Chairman Wilson) Other than Turkey Creek?

A. That is correct, yes.

Q. That is the way we understand you.

A. Yes.

Q. Now, if you will direct your attention to that portion of the Missouri River beginning at the state line and below.

A. (Indicating)

Q. And now go back to the Kansas River.

A. (Indicating)

Q. With reference, first, to the sewage or industrial waste which enters the Missouri River from the Fairfax Industrial District as shown on this--we have the small map here Exhibit 14 which shows the boundaries of the

Fairfax Industrial District, if you will refer to that, please, if necessary, so that you have in mind the boundaries of the Fairfax Industrial District. I think that is properly called the Fairfax Drainage District. And if you have in mind the sewage and industrial wastes entering from those outlets.

A. I see there is no breakdown of information on these individual sewers to which you are referring in Exhibit 15.

Q. You have just referred to Exhibit 15, the tabulation of discharges from the different sewer outlets, have you not?

A. Yes.

Q. Well, is there any information on that exhibit or do you have enough information from any source as to the outlets discharging into the Missouri River within the boundaries of the Fairfax Industrial or Drainage District so that you can base an opinion on the significance of that discharge on the waters below?

A. I am afraid I am not sufficiently familiar with the breakdown to be in a position to render an opinion on this.

Q. Well, either individually or as a whole, have you any data before you or what was obtained from your own studies on which you can base an opinion as to the significance of the aggregate discharge from within the boundaries of the Fairfax Industrial or Drainage District?

A. Are you referring to the outlets shown only within the outline of the Fairfax Industrial District, that is the outlets F-11 through 18?

Q. That is correct.

A. Those are the only ones you are referring to?

Q. I wish to ask you this question, Mr. Kittrell, and preliminary thereto I am asking whether you have sufficient data on which you can answer the question. My question is simply this, whether the sewage entering or industrial wastes entering the Missouri River through any or all outlets originating within the boundaries of the Fairfax Industrial or Drainage District makes a significant contribution to the pollution of the Missouri River so as to endanger the health or welfare of persons in the State of Missouri?

A. I do not have a sufficient breakdown on those particular sewers to render an opinion.

Q. Very well. Then referring again to the Kansas River, what is your opinion as to whether or not the discharges of sewage or industrial wastes entering the Kansas River from all outlets along that river within the boundaries of the City of Kansas City, Kansas, other than the Turkey Creek outlet, contribute to the pollution of the Missouri River below the mouth of the Kansas River to such an extent as to endanger the health or welfare of persons in the State of Missouri, whether that sewage entering from those outlets makes such a significant contribution to that pollution as to have the effect that I stated?

A. Now, you referred this to the Missouri River in Missouri, did I understand you correctly?

Q. In Missouri, yes.

A. Yes, I believe it does.

Q. With reference to any sewage or industrial waste entering the Kansas River in this Argentine Industrial District or elsewhere above the limits of the City of Kansas City, Missouri, can you give us an opinion on the same question, as to whether such sewage or industrial wastes would make a significant contribution to the pollution of the Missouri River below the mouth of the Kansas River so as to endanger the health or welfare of persons in the State of Missouri?

A. Government Exhibit 15 gives rather limited information on that. I see no sewered population indicated. There is some BOD and suspended solids. If we are referring to that alone, I mean considering that alone without any consideration of that as a portion of the total--

Q. Well, when I say significant contribution, I mean, of course, in connection with whatever else there is, but by itself it would have to be significant. I think you understand what I mean by significant. It must be substantial. It must be such that it would add to the aggregate pollution load and thereby contribute to the situation that might endanger the health or welfare of persons in the State of Missouri.

A. I am afraid I don't have enough information on the nature of the particular wastes from the Argentine area to answer that question.

CHAIRMAN WILSON: Very well. Now, then, I would simply like to say this to counsel for the government. It is apparent here that on the basis of Mr. Kittrell's opinion he is unable to express an opinion as to the significance of the contribution of sewage or industrial wastes arising from North Kansas City, Missouri, or this Fairfax Industrial or Drainage District, or the Argentine Industrial District or other areas above Kansas City, Missouri, so that he can say that sewage or industrial wastes originating from those areas makes any significant contribution that would affect the health or welfare of persons in another state. So that as his opinion stands, I am not attempting to analyze other testimony, but as his opinion stands we are limited with reference to such effects to the two Cities of Kansas City, Missouri, and Kansas City, Kansas. And for the information of this Board, if the government wishes to supplement other testimony already submitted or add other testimony, the Board would like to have it because it will certainly bear on the decisions that we have to make under the notice.

MR. EDELMAN: Mr. Chairman, I wonder if I may ask just one question of Mr. Kittrell in the light of your explanation of what you mean by significant.

REDIRECT EXAMINATION

BY MR. EDELMAN:

Q. I direct your attention to the Government Exhibit 15 and the heading "Fairfax-Jersey Creek Unit" which shows F-7, Jersey Creek Sewer outfall, owner Fairfax Drainage District, indicating a Kansas City, Kansas, contribution of 40,000 sewered population.

MR. EDELMAN: Was F-7 included?

CHAIRMAN WILSON: You are referring to Exhibit 15. Which page?

MR. EDELMAN: Did you include F-7 in your question to Mr. Kittrell, Mr. Chairman?

MR. JOHNSON: No, but it is below that outlined area, even though it drains it.

MR. EDELMAN: I withdraw the question.

MR. STEIN: Mr. Chairman, for purposes of clarification of the record, I wonder if I could ask Mr. Kittrell two questions on direct.

Q. (By Mr. Stein) Mr. Kittrell, I refer your attention to Government Exhibit No. --

MR. KOENIGSDORF: Are you off on another matter?

MR. STEIN: No.

MR. KOENIGSDORF: If you are, I want to--

MR. STEIN: No, the same.

MR. KOENIGSDORF: --ask some questions before you do that if I might. I didn't want to interrupt the Chairman, but at this point as to the question that was asked the witness referring to Turkey Creek and generally whether in his opinion it would endanger the health and welfare of persons, at this time I would like to object to the question and answer and ask that they be stricken, in view that the question was leading, it called for a conclusion on the part of this witness, that it invaded the province of this Commission as calling for an ultimate, and that it was based upon knowledge which was not particularly within the province of this witness.

CHAIRMAN WILSON: Objection overruled. Motion denied.

Q. (By Mr. Stein) Mr. Kittrell, may I refer your attention to Government Exhibit 17, outlet N-2, which I believe was referred to in a question directed to you by the Chairman.

A. (Indicating)

Q If we would assume that N-2 was connected to a sewered population of 2,000, would that cause you to change your opinion?

A. I would say that would be a significant contribution to the total effect which is a hazard to health or welfare.

Q. But the chart you referred to did not have any such--

A. I did not see any such indication on the chart.

Q. May I refer your attention to Government Exhibit No. 18. I call your attention to outfalls C-15 to C-20, inclusive. Would you point to those on the chart, Mr. Kittrell?

A. (Indicating)

Q. If these outfalls in the aggregate should discharge to the Kansas River wastes from Missouri in the amount of .8 million gallons a day, of a BOD of 3,425, and suspended solids of 7,100, would you consider that contribution, taken together with other contributions in the Kansas River, as a contribution to the pollution of that river?

A. Yes.

MR. STEIN: No further questions, Mr. Chairman.

CHAIRMAN WILSON: Any further cross-examination by counsel?

Members of the Board?

That is all, Mr. Kittrell.

(Witness excused)

MR. SAMSON: Mr. Stein, for the purpose of information, I don't recall, is there anything in the record here that sets up the sewered population in connection with sewer outfall N-2?

MR. STEIN: There is nothing in the record relating to N-2 yet, sir.

MR. SAMSON: All right. That is all I wanted to know. Thank you.

CHAIRMAN WILSON: We had a request from counsel for one of the parties to the notice to be permitted to make a statement at this time. I understand it is agreeable to government counsel.

MR. STEIN: Yes, it is.

CHAIRMAN WILSON: And no objection by other parties, I assume?

Very well, counsel. Where is the counsel who wanted to make that statement? Yes. Give your name and representation to the reporter, please.

MR. ZENGELER: Ludwig Zengeler, National Cylinder Gas Company.

CHAIRMAN WILSON: May I have that full name again, please?

MR. SALOME: May we have it?

MR. ZENGELER: Ludwig Zengeler, L-u-d-w-i-g Z-e-n-g-e-l-e-r, National Cylinder Gas Company.

MR. SAMSON: Mr. Roper made an appearance here. He is the general manager?

MR. ZENGELER: Yes.

MR. SAMSON: All right.

CHAIRMAN WILSON: Are you an attorney?

MR. ZENGELER: No, I am a vice-president from our Chicago office.

CHAIRMAN WILSON: Do you wish to be sworn as a witness to make some statements of fact?

MR. ZENGELER: Yes.

CHAIRMAN WILSON: Very well. You may be sworn, then.

LUDWIG ZENGELER,

called as a witness on behalf of National Cylinder Gas Company, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY CHAIRMAN WILSON:

Q. Just as preliminary, you have given us your name as Ludwig Zengeler?

A. Zengeler, yes.

Q. Vice-president of--

A. National Cylinder Gas.

Q. --National Cylinder Gas Company, one of the parties on which notice was served in this proceeding?

A. That is right.

Q. You are not an attorney?

A. No.

Q. Is your concern at this time represented by an attorney present?

A. No.

Q. But you wish to make a statement or admit some evidence in behalf of your company under oath, is that true?

A. That is right.

Q. You may proceed.

A. National Cylinder Gas location is listed on Exhibit 14 as AM-4 and the size of the steel pipe to the river is given as two and a half inches and identified as sewer.

In Exhibit 15 no average flow, suspended solids or BOD figures are listed. As I mentioned before, the pipe is identified as sewer and since this is commonly understood to discharge unsanitary matters, which is not the case with us, I would like to have this changed to waste outfall.

What we are discharging into the river is a pure lime solution of approximately five percent concentration. This lime is a waste product from acetylene generation, from calcium carbide.

This factory was put in operation in 1946 and prior to discharging the lime slurry into the Kansas River we obtained permission from the State of Kansas Forestry, Fish and Game Commission, also from the U. S. Corps of Engineers, to dispose of the lime slurry in this manner.

In regards to quantity, this plant is operated 16 hours per day, five days per week, and the average discharge of lime in the slurry is not more than 200 pounds per hour over the entire operating period of 16 hours per day. Pure lime is used extensively for neutralizing acids and should be very helpful in conditioning the river water. The same type of lime slurry is used by some municipalities to destroy slime bacteria in sewers and to control hydrogen sulfide generation.

I have a letter from the County Sanitation Districts of Los Angeles County, California, dated April 2, 1959, outlining the use of lime slurry supplied by us for treatment of their sewers. May I read that letter, Mr. Chairman?

CHAIRMAN WILSON: If there is no objection, you may read it.

MR. STEIN: No objection.

CHAIRMAN WILSON: Or offer it in evidence. Is it very long?

A. No, not very long.

CHAIRMAN WILSON: Well, as long as there is no objection, you may read it.

A. That is to our Mr. J. M. Soyars, District Manager, National Cylinder Gas Company, 4560 Pacific Boulevard, Los Angeles 58, California.

"Dear Mr. Soyars: As you know, for a number of years the Sanitation Districts have used lime slurry obtained as a by-product from the manufacture of acetylene gas for treating trunk sewers as a means of control of hydrogen sulfide generation in the sewers. The method has been quite successful since sulfate splitting bacteria, which thrive in the slime of a sewer pipe, cannot tolerate a high pH obtained when the lime slurry is discharged as a slug. The program as used by the Sanitation Districts is as follows.

"A 5,000-gallon vacuum truck is loaded with lime slurry containing approximately 25 percent solids by weight at the acetylene plant which is then driven to pre-selected manholes where the lime slurry is discharged at a rate sufficient to maintain a pH of the sewage slurry mixture of pH of 12 or above. Naturally the rate of discharge will vary depending upon the size of the sewer being treated and the amount of flow in the line at the time. A discharge over a period of 30 to 45 minutes at a rate sufficient to raise the pH of the sewage slurry mixture to pH of 12 is sufficient to destroy the slime bacteria. Regrowth of the bacteria occurs gradually and the treatment must be repeated in some sewers on a cycle of about two weeks in order to control sulfide generation within a tolerable level.

"The advantages of using lime slurry for sulfide generation over other methods such as chlorination or chemical treatment are both evident from the cost viewpoint and ease of handling. Coat analysis has shown that where lime slurry can be obtained free of cost at the acetylene plant, sulfide control will be obtained as economically as any other method and the operation does not entail handling of a hazardous gas such as chlorine. The operation is very simple since treatment can be placed on a routine basis, requiring only the tank truck driver for manpower.

"One disadvantage in using lime slurry for sulfide control arises when the sewer is flowing at too low a velocity or where impurities in the lime slurry mixture such as sand settle out, causing partial stoppages in the line. This may further retard the velocity and actually increase the possibility of sulfide generation occurring over a period of time. Another disadvantage of lime slurry mixture is that sulphur impurities present result in the formation of hydrogen sulfide which could cause concentration of hydrogen sulfide gas in the atmosphere of the sewer if the pH of the lime slurry mixture were permitted to drop such as would be the case if the material were not discharged as a slug. Hydrogen sulfide in the atmosphere of the sewer would, of course, be very dangerous to personnel who might be engaged in inspection or cleaning of the line. Any agency contemplating the use of lime slurry mixture for sulfide control would be well advised to consider the potential hazards of hydrogen sulfide in the lime slurry.

"The Sanitation Districts have also from time to time used the carbide lime by-product for raising the pH of the sludge in the digestion tanks at the Joint Disposal Plant. This would be necessary only if an upset occurred in the digestion and high volatile acid concentrations lowered the pH of the mixture below a level at which proper bacterial action can occur and digestion of the sludge continue.

"It is hoped that the above brief discussion of the Sanitation Districts' program and use of lime slurry from your plant will be of interest to you and of some help in furthering disposal of this type of material in other sections of the country.

"Very truly yours, C. R. Compton, Chief Engineer and General Manager, by John D. Parkhurst, Assistant Chief Engineer."

To my knowledge, a competitor of ours has been, for years, discharging their lime slurry in the City of St. Louis sewers for the same purposes as mentioned here for Los Angeles.

Q. (By Chairman Wilson) In what city?

A. St. Louis, Missouri. Our company is also operating an acetylene generating and compressing plant at Detroit, Michigan, and all our lime slurry, which is approximately eight times the quantity we are producing here, is sold to the Cities of Detroit and Dearborn for sewerage treatment.

Based on the aforementioned facts, Mr. Chairman, we would appreciate if the Board would consider removing our name from the list of industrial establishments accused of causing or contributing to the pollution of interstate waters.

Q. That completes your statement, Mr. Zengeler?

A. Yes, sir.

CHAIRMAN WILSON: Does counsel have any cross-examination?

Members of the Board?

MR. STEIN: We have just one question.

CROSS-EXAMINATION

BY MR. STEIN:

Q. Are you aware of the objectives of the Missouri Valley states contained in the comprehensive program for the control of water pollution, Exhibit No. 9?

A. No. As I mentioned, when we started that originally we had permission from the State of Kansas and--what is that agency?--Forestry, Fish and Game Commission, also from the U. S. Engineers, to dispose that residue, lime residue, in the river.

Q. Just one more question. I understand that you had approval back in 1940, as you say--

A. 1946.

Q. --1946 from the Fish and Game Commission and the Corps of Engineers?

A. Right.

Q. Do you have a permit for your waste discharge from the Kansas State Board of Health, the official water pollution control agency of the State of Kansas?

A. Not to my knowledge.

MR. STEIN: No further questions.

REDIRECT EXAMINATION

BY CHAIRMAN WILSON:

Q. Mr. Zengeler, you are not disposing of the waste from this plant under consideration here for any sewage or sewer treatment purposes such as you described or such as were referred to in the letter that you read, are you?

A. No, sir. I just wanted to bring out that in our opinion it is not harmful to pollution, what in general seems to be the term of pollution discussed here.

Q. You are discharging this lime slurry from an outlet on the banks of the Missouri River, are you not?

A. Kansas River.

Q. The Kansas River. Could you give us an estimate of the total number of pounds or tons per year of lime that enters the river through that outlet?

A. Well, it would be at an average--it depends on our business--at an average it is 200 pounds of lime in the slurry per hour or which would be about 33 and a half tons a month based on a dry lime basis.

Q. Are you personally familiar with the appearance of this discharge at your outlet?

A. Yes, sir.

Q. Have you noticed whether or not there has been any accumulation of lime deposited on the banks or on the bed of the river?

A. No, sir, there is two outfalls from the Kansas Municipal Power Plant. One is in use and the other one I understand is for a spare or reserve and for increased power generation and then that would be used there. Now, our outlet pipe is tied in with the outfall which is not used yet, so immediately there there is some lime accumulation. I was over there yesterday to look at it. Directly on the side of it, which is only separated by a 12-inch wall, there is a large stream of water coming out of the Kansas Municipal Power Plant, so everything is carried off. I would say the area where you maybe can notice some lime isn't larger than one section of this table.

Q. Well, does the amount of lime that is deposited in this area increase?

A. No, sir, it is carried off with the stream.

Q. It is carried off in suspension in the water?

A. In suspension in the water.

Q. Well, does this lime finally become completely dissolved in the water or is it simply carried away in suspension?

A. Well, I would say it is carried away in suspension. It is microscopic to start out with. It would be maybe the same term like maybe, say, fine silt.

Q. Do you know of any place where it accumulates or causes any deposits on the bed of the river?

A. I haven't seen any.

CHAIRMAN WILSON: That is all.

THE WITNESS: Thank you. The river has a fairly swift current right around the bend there.

Thank you.

(Witness excused)

CHAIRMAN WILSON: Go ahead, Mr. Stein.

MR. STEIN: Dr. Graham Walton.

GRAHAM WALTON,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. EDELMAN:

Q. Will you please give your full name, Dr. Walton?

A. Graham Walton.

Q. By whom are you employed?

A. Robert A. Taft Sanitary Engineering Center, U. S. Public Health Service, Cincinnati, Ohio.

Q. What generally are the duties of your present position?

A. My current title is in charge of water conservation studies. Previously I was in charge of water treatment evaluation studies. I am in the engineering unit of the water supply and pollution research branch of the center.

Q. How long have you been employed by the Public Health Service?

A. For over seventeen years.

Q. Prior to this employment did you have any experience in the field of water supply?

A. Prior to that I taught at the University of Wisconsin for eight years and at the State School of Mines at South Dakota for five years, including subjects in water supply and sewage treatment.

Q. Dr. Walton, what formal degrees do you hold?

A. I have a Bachelor of Science, majoring in math, Bachelor of Science in Sanitary Engineering, a Master of Science in Civil Engineering, and a Ph.D with a major in sanitary engineering.

Q. In the course of your education and experience, Dr. Walton, have you become familiar with the method of operation of water treatment plants in the United States?

A. I believe I have.

Q. And have you familiarized yourself with the problems they face in producing a safe and potable water for consumption?

A. I believe I have.

Q. Can you tell us, Dr. Walton, the nature of the problem faced by water treatment plants in dealing with a heavily-polluted source of surface water?

A. Their first obligation or object is to furnish a safe water. This means a water free of pathogenic organisms. They must also be concerned with providing a satisfactory water from the standpoint of taste, odor and industrial usage.

Q. Dr. Walton, do you consider that surface water which has a high level of coliform bacteria and which is associated with the recent discharge of untreated sewage constitutes a satisfactory source of water supply for a municipality?

A. Certainly a raw water with a high level of coliform bacteria, obviously associated with sewage discharge, is not a desirable source from which to produce a potable water.

Q. Why not?

A. The higher the coliform density the more probability there is of pathogenic organisms in the water; the higher the concentration of pathogenic organisms in the water the more chance there is that some may get through the water treatment process.

Q. What is the major process used in water treatment plants to eliminate the pathogenic organisms that might otherwise pass through?

A. The water treatment process is a combination of more than one major thing. We first start in with coagulation and sedimentation. This removes a very substantial portion of the suspended matter. At this same time a disinfectant, practically always chlorine or some form of chlorine compound, may be added. This can destroy or inactivate the organisms, providing it is there in sufficient quantity. And then thirdly, we have filtration, which removes much of the material that has previously been flocculated or entrapped in fine flock that will not settle on the surface of the filter.

Q. Chlorination, though, is used to help destroy the micro-organisms, is it not?

A. It is my opinion that it would be impossible to provide a safe water in this country without chlorination in most of our surface waters.

Q. The amount of chlorine that is used in this kind of treatment would vary with the amount of pollution that comes in from a source, would it not, Dr. Walton?

A. It tends to vary with the amount of pollution.

Q. In the course of your official duties have you visited water plants on the Missouri River below Kansas City?

A. I have.

Q. Did you visit the Lexington plant?

A. I did.

Q. Can you describe the processes used by the Lexington plant, that is describe them briefly?

A. Like most Missouri River plants, it provides a high degree of treatment using monostage coagulation, sedimentation, chlorination providing a theoretical contact time of in the neighborhood of 60 hours, followed by filtration and a high level of chlorine application.

Q. Is this treatment consistent with what you would expect of a plant which treats heavily-polluted water?

A. It is.

Q. Did you visit the Glasgow plant?

A. I did.

Q. Would you describe briefly the nature of the treatment there?

A. The Glasgow treatment is quite similar, providing facilities for monostage coagulation, a relatively high level or prechlorine application, and substantial contact time. I can't remember exactly what it is. I can look it up if desired, but it is in excess of 24 hours.

Q. Did you give us the date of your visit--

A. Plus filtration. Pardon me.

Q. Did you give us the date of your visit or visits to the Glasgow plant?

A. I did not.

Q. May we have it?

A. December 2, 1959.

Q. I don't recall whether you identified the date of your visit to Lexington either.

A. December 1, 1959.

Q. Did you visit the Boonville plant?

A. I did.

Q. Can you tell us when?

A. December 3, 1959.

Q. Very briefly, does this provide the same sort of treatment that is provided at the upstream plants?

A. Not quite the same. It uses long-time presettling followed by addition of chlorine, the coagulants, with mixing and coagulation and settling in a patented type upflow-clarifier followed--there is prechlorination there, maybe I should say chlorination after the presettling tanks. There is roughly about seven hours contact of chlorine, after which--after the rapid sand filtration, ammonia is added to put the chlorine residual in the form of chloramines. The level of chlorine is quite high, chlorine application.

Q. Dr. Walton, in the course of your visits and study of these plants did you have occasion to familiarize yourself with the level of bacterial contamination reported at the water sources for these respective plants?

A. I did.

Q. Have you as part of your official duties studied a number of water plants which use heavily-polluted surface water as a source of water supply?

A. During 1954 and 1955 I made a quite extensive study.

Q. How many plants were included in this '54 to '55 study?

A. I visited, to my knowledge, the 54 more heavily loaded plants in the country that had data that could be used in such a study.

Q. Dr. Walton, can you tell us how the level of bacterial contamination at these three water plants on the Missouri compares with the levels that you found at these 54 other plants?

A. The--

Q. Let's take Lexington to start with.

A. --coliform density in the raw water, raw Missouri River water, as received at the Lexington plant is, to my knowledge, the highest raw water coliform density of any supply used as a source by a municipal plant in the United States.

Q. Dr. Walton, have you prepared a chart showing the relative position of these communities with respect to the level of bacterial contamination?

A. I have.

MR. EDELMAN: I would like to have that marked as Exhibit 59 for the government.

(Government's Exhibit No. 59
marked for identification.)

MR. EDELMAN: This chart bears the legend "Annual Raw Water Coliform Densities, Lexington and Boonville".

Q. (By Mr. Edelman) Will you describe that chart, please, Dr. Walton?

A. The chart on the ordinate is the annual average coliform density per hundred milliliters expressed in thousands per hundred milliliters. I have had to use a log scale to get along, so this would be 1,000, 10,000, 100,000 and 1,000,000. This is an average annual coliform density. These are the number of water plants treating waters containing such coliform densities. For example, one plant that I studied, I believe it is--yes, this is one--had a coliform density annual average of over a million. The second highest was 800,000, and so on down the line. You will note that there are three plants that treated raw water with coliform density in excess of these values indicated for Lexington. I will point out one of these plants was not used as a potable water supply. It was industrial cleanup supply only. A second plant has since gone to another source for its potable water supply. It again was an industrial water supply. The third plant, as far as I know, is still using this water, but it is also an industrial water supply, not a community water supply.

So this 130,000, this 107,000, this 93,000 as an annual average coliform density exceeds any municipal plant--the coliform density in the raw water treated by any municipal plant, to my knowledge, in this country.

CHAIRMAN WILSON: Just a minute, before you go any further, Dr. Walton. We understood that you were simply explaining the composition of this exhibit. It hasn't yet been formally offered in evidence.

MR. EDELMAN: I would like to offer it now, Mr. Chairman, as Government Exhibit No. 59.

CHAIRMAN WILSON: Any objection?

It will be received.

(Government's Exhibit No. 59 received in evidence.)

CHAIRMAN WILSON: You may proceed.

Q. (By Mr. Edelman) Where does Boonville stand on this honor roll, Mr. Walton?

A. I have shown Boonville in here--I might retrench just a minute. I only had ten months of data when this chart was drawn, ten months for '57. In '59 there was a July through December period only that data was available, inclusive. 1956 was for the full twelve months and for Lexington this value of 1958 was January through July.

For Boonville I have only shown two years. 86,000 for the full year twelve-month period in 1957. This would place it as the third most heavily contaminated water as indicated by coliform bacteria to my knowledge in the country. There is one other plant that comes in between Lexington and Boonville--pardon me--municipal plant. I am excepting these three industrial plants up here. The 58,000 places it down a little farther on the scale.

Q. Do you have a chart which shows the monthly averages for these points, Dr. Walton?

A. I do.

Q. May we have that?

MR. EDELMAN: This chart bears the legend "Maximum Monthly Raw Water Coliform Densities - Lexington and Boonville".

(Government's Exhibit No. 60 marked for identification.)

MR. EDELMAN: That is Government Exhibit 60.

Q. (By Mr. Edelman) It is similar in appearance to the other chart, is it not, Dr. Walton, the same--

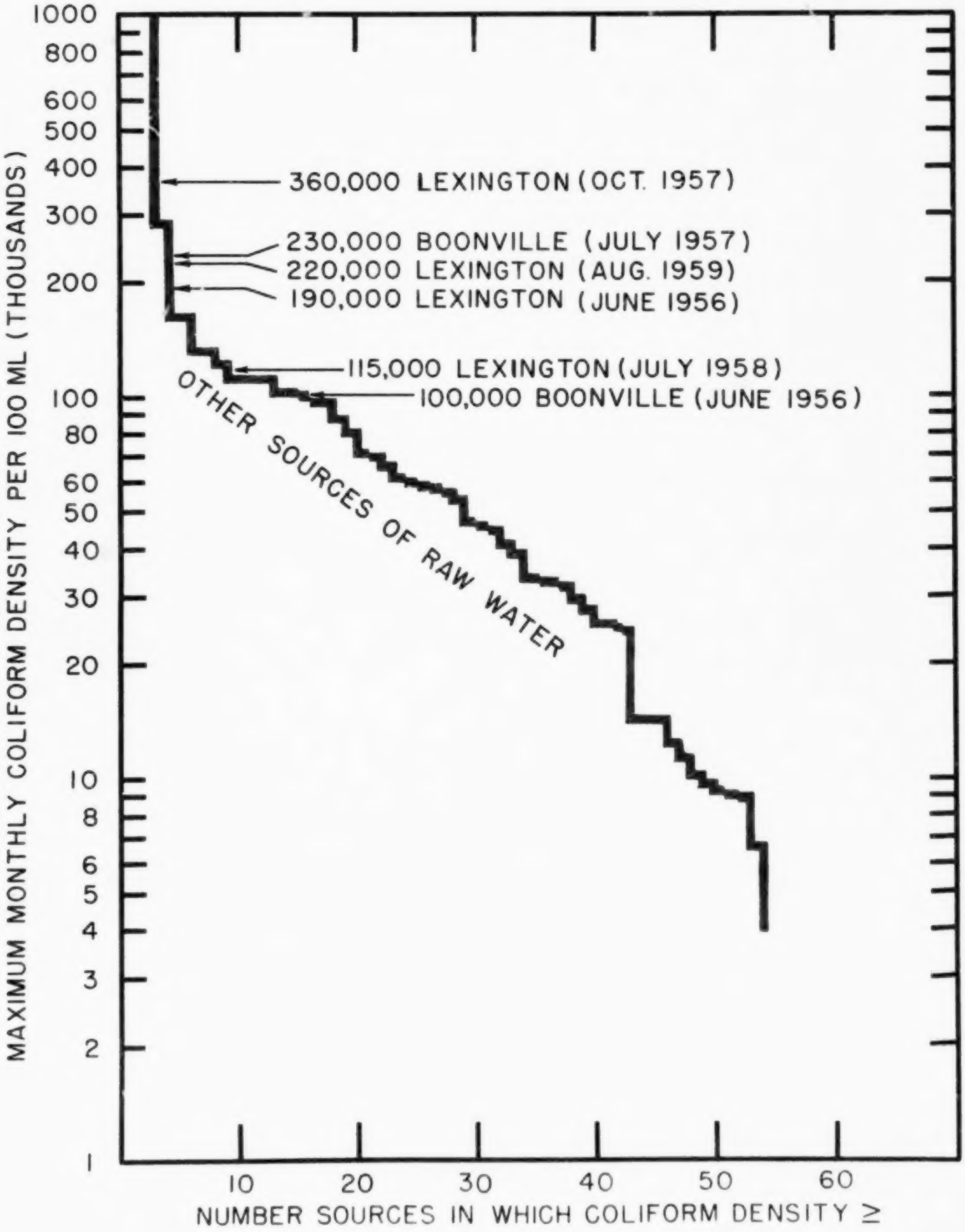
A. It is similar except that I have in plotting this data used the maximum of the 24 months of record that I took from each plant in my study.

MR. EDELMAN: We would like to offer this in evidence as Government Exhibit No. 60.

CHAIRMAN WILSON: Any objection?

MISSOURI RIVER BELOW KANSAS CITY
METROPOLITAN AREA

MAXIMUM MONTHLY RAW WATER COLIFORM DENSITIES – LEXINGTON AND BOONVILLE



Hearing none, it will be received.

(Government's Exhibit No. 60 marked for identification.)

MR. EDELMAN: That is Government Exhibit 60.

Q. (By Mr. Edelman) It is similar in appearance to the other chart, is it not, Dr. Walton, the same....

A. It is similar except that I have in plotting this data used the maximum of the 24 months of record that I took from each plant in my study.

MR. EDELMAN: We would like to offer this in evidence as Government Exhibit No. 60.

CHAIRMAN WILSON: Any objection?

Hearing none, it will be received.

(Government's Exhibit No. 60 received in evidence.)

A. I again point out logarithm scale, coliform densities are in thousands per hundred milliliters, these values being 1,000, 10,000, 100,000, and 1,000,000. We have the same three industrial plants, two of which are no longer using or never used the water as a potable water supply.

Boonville up here for October 1957, 360,000 is the highest of any municipal plant, highest coliform density in any raw water treated by a municipal plant, to my knowledge, in this country.

Q. (By Mr. Edelman) You meant to say Lexington?

MR. JOHNSON: You said Boonville.

A. Pardon me, Lexington. Correct that.

Boonville for July 1957 comes in at 230,000 and there is one other plant in here I point out, so Boonville would come in number three in the municipal plants in that year. These other years show that Lexington is still very high for other years; Boonville on this only other year I have shown is somewhat lower down the scale.

Q. (By Mr. Edelman) Dr. Walton, does the treatment of water so heavily polluted present problems to these water plant operators other than those related to the removal of microorganisms?

A. A treatment of this type of water containing heavy sewage pollution is always a problem of taste and odors, grease, other materials that may be there. It certainly does create problems to the water plant operator.

Q. Can you tell us how this problem presented itself at Lexington during your inspection of the plant if you became aware of it?

A. I was informed at Lexington that they had no major taste and odor problems that they could not handle. I will point out they were using very heavy chlorine application to handle taste and odor problems as well as to insure a safe water or to try to insure a safe water, maybe I should say. They were also using some carbon from time to time, although the dose was light and it was periodic.

I might also point out that while there I could detect no taste or odor in the water at the tap at the plant. I did detect it in a restaurant uptown. Whether this was due to the water, the glass, the material the glass had been cleaned with, or even the ice, I cannot say.

Q. Dr. Walton, have you familiarized yourself with the increasing level of chlorine application by plants in this stretch of the Missouri River?

A. With some plants, yes.

Q. What plants are those?

A. Kansas City, Kansas, Boonville, Missouri, St. Louis County, North Central Plant.

Q. Can you tell us whether the application of chlorine by these plants has increased, decreased or remained substantially the same over the past, say, twenty years?

A. I can.

Q. Will you please tell us what your figures actually show in this regard?

A. Starting in 1940, Kansas City, Kansas, applied 17-plus pounds per million gallons; Boonville 23-plus pounds per million gallons; St. Louis Central Plant 13-plus--I am going to give the first two figures only--13 pounds per million gallons.

CHAIRMAN WILSON: That was for what?

A. St. Louis County Central Plant.

CHAIRMAN WILSON: Oh.

A. Five years later, 1945: Kansas City, Kansas, 28; Boonville, Missouri, 83; St. Louis County Central Plant, 19.

1950: Kansas City, Kansas, 36; Boonville, 84; St. Louis County Central Plant, 32.

1955: Kansas City, 45; Boonville, 93; St. Louis County Central Plant, 18.

1959: Kansas City, 48; Boonville, 100; St. Louis County Central Plant, 54.

Q. (By Mr. Edelman) Do you consider the level of--

MR. SAMSON: Mr. Edelman, pardon me. What was your computation on Boonville in 1940, Doctor?

A. 1940, Boonville was 23.

MR. SAMSON: Thank you very much.

A. I have the information annually and could give the Board a copy of this if they desire.

Q. (By Mr. Edelman) What does this level of chlorine application at Boonville and St. Louis indicate, in your opinion, Dr. Walton?

A. It certainly--

Q. With respect to the character of the water supply used as a source?

A. It indicates probably several things. One is an increasing pollution problem, increasing awareness of taste and odors and use of chlorine for its control, increased insurance or attempt to insure a safe water at all times. I must note that there has been an increasing tendency of water plant operators to use more chlorine in this country over the past few years. Part of this is just a greater concern of providing a water which should be free of any pathogenic organisms.

Q. Dr. Walton, in your opinion does the pollution of the source of water supply for the municipalities that you visited along this stretch of the Missouri River represent a health hazard to persons who are served by those water treatment plants?

A. Certainly it increases the possibility of pathogenic organisms getting through the protection provided by the water treatment plant, and anything that increases that would increase the hazard to the people consuming the water.

Q. The present water treatment, Dr. Walton, would I be correct in describing it as providing a factor of safety to the people who use this water or margin of safety?

A. I am going to be very honest. Some of the plants provide a substantial safety factor and some of them don't, in my opinion.

Q. Would it be correct to say, Doctor, that the heavier the pollution load at the intake the less the margin of safety unless the treatment is also increased accordingly?

A. With the increasing pollution load you either have to increase your treatment or decrease your margin of safety.

Q. Do you consider that the treatment processes presently used at the plants that you visited in this stretch of the Missouri River guarantee the destruction of all pathogens which may reach the plant from the Missouri River?

A. I could not guarantee the destruction or inactivation of all pathogenic organisms.

Q. In other words, this is a potential hazard?

A. This is a potential hazard.

Q. Dr. Walton, what do you think of the possibility of using raw untreated sewage as a source of water supply?

A. It will be done in space flight; it is possible.

Q. What do you think of the desirability of substituting settling in a water treatment plant for primary treatment of raw sewage?

A. I am not ready to accept raw sewage as the intake water for a water treatment plant.

Q. Dr. Walton, some mention was made yesterday about a community, I think it was Chanute, which recirculated its sewage. Did you have occasion to visit that community and observe this operation?

A. I did.

Q. Was this sewage recirculated raw into the water treatment plant?

A. No.

Q. Can you tell us how this operation was carried on?

A. The sewage was taken to, I would say, a modern sewage treatment plant, completed, I think, around 1955. Treatment consisted of bar screens for removing the coarser matter, sedimentation, application to a trickling filter with recirculation and final sedimentation. At the time I was there, if I remember correctly, or immediately thereafter they chlorinated the sewage plant effluent. I might add that there was one other very substantial element in the treatment of this sewage prior to the intake at the water plant and this was the temporary dam that had been thrown up below the sewage plant effluent to back the liquid up to the water intake, had created a long, shallow impoundment. I think the maximum depth was not much over five or six feet and it probably averaged only three or four feet depth. It would hold about 20 days' supply and because a sewage plant outlet was right near the dam at one end and the intake to the water plant was at the very head end of this pool, you had theoretically about 20 days' retention in this holding pond or impoundment which served excellently as a tertiary sewage treatment.

Q. Dr. Walton, was this water aesthetically acceptable to you when you were there?

A. It was not aesthetically acceptable to me and I doubt if it was to the people because of the bottled water I saw in the store windows.

MR. EDELMAN: That is all we have, Mr. Chairman.

CHAIRMAN WILSON: I think that before we proceed with any further examination, it is nearly 12 o'clock and some of the members of the Board have noon engagements, so we will take our recess until 1:30.

- - -

WHEREUPON, the hearing stood at noon recess until the hour of 1:30 o'clock in the afternoon, at which time the following further proceedings were had and entered of record, to-wit:

- - -

AFTERNOON SESSION, WEDNESDAY, JUNE 15, 1960

CHAIRMAN WILSON: The hearing will come to order.

Before we proceed, it has been suggested that we work this afternoon the usual session until 5 o'clock, then take a recess and reconvene at 7 for perhaps a couple hours. Is that satisfactory?

If I hear no objections, that will be the intention. If there is anyone who thinks that we are dragging out too long in the evening, the reporter or counselor or anyone else, why, they can make it known during the session and we will decide what is best to be done at the time.

You may proceed, Mr. Stein.

MR. EDELMAN: Mr. Chairman, you will recall that before the noon recess we had completed our direct examination of Mr. Walton. He is now available for cross-examination.

CHAIRMAN WILSON: Very well. Counsel may cross-examine.

GRAHAM WALTON,
resumed the stand and testified further as follows:

CROSS-EXAMINATION

BY MR. POWERS:

Q. Doctor, you went out for lunch, did you?

A. I did.

Q. Did you drink any water?

A. I believe so, yes.

Q. How did you like it?

A. It is all right.

Q. Tasted good?

A. Pretty good.

Q. You felt safe in drinking it?

A. Yes.

Q. Well, are you aware that above the intake of the Kansas City Water Plant, in the water which you were drinking the testimony of Exhibit 57 is that there were 65,000 B coli before treatment?

A. I have known that the magnitude was in that neighborhood, yes.

Q. Dr. Paul M. Kabler testified there were 52,000. Were you aware of that?

A. I knew it was in that neighborhood, yes.

Q. In spite of that, you felt safe in drinking this water?

A. I did.

Q. What cities use untreated water?

A. That is rather a big question.

Q. Well, you are a big expert.

A. My interest has been in water treatment, not in untreatment.

Q. I believe you have studied a large number of cities and you must have ascertained--

A. Only the water treatment provided by many cities.

Q. And you are not aware of the cities that do not use untreated water?

A. I might mention in this respect, to my knowledge, if the information I have is correct, there is only one community in the State of Kansas, a community supply, that is not treated today. That can be checked if desired with the State Board of Health of Kansas.

Q. Well, I was thinking in the larger terms of the whole country which you have surveyed, have you not?

A. I have not surveyed all water plants in the country.

Q. So your information is just restricted to the actual 42, is it, that you have examined?

A. There is 54 and they were in 22 states from Texas to Massachusetts, from Georgia to Minnesota. They were all water plants that had adequate data and high coliform densities in the raw water.

Q. Would you say by and large that no city of substantial size uses untreated water?

A. If they do, in my opinion they are making a mistake.

Q. So that if any water plant should break down by accident, or so on, you would say that the inhabitants ought not to be drinking that water?

A. I am not quite sure. You say any, that is all inclusive. There are some waters from protected sources that are still treated, at least by chlorination, that might be reasonably safe, but they are using chlorination as an additional safety factor.

Q. Now, as to the use of inadequately treated water, how many bacteria does it take to kill you? In other words, are you any deader by falling from a 20-story building than from a 10-story building?

A. I don't know that an infectious dose of, say, the bacillus causing the typhoid fever has ever been determined.

Q. Well, it doesn't take many to infect you, does it?

A. I think this is a reasonable assumption.

Q. Now, water which contains the B coli is not necessarily dangerous in itself, is it, just because it has a large volume large amount, of B coli per hundred milliliters?

A. If I could be sure that these were non-pathogens, the presence of B coli and nothing else, I would not consider it dangerous.

Q. And so the extent of the other pathogenic bacteria has to be more or less estimated, doesn't it?

A. This is true.

Q. How did you come to examine the Lexington and the Boonville plants?

A. In connection with this hearing.

Q. Just for the purpose of accumulating some data for this hearing?

A. I have been into them before. The time I was in previously they did not have the data. They do not appear on the original lines of the charts because at the time of my study data was not available from Lexington and Boonville.

Q. I believe you said the taste and odor of these plants was acceptable?

A. The plant operators, according to my understanding, reported that they had no real problem with taste and odor of the finished water. I mentioned that at Lexington there was no taste in the water that I could detect at the plant tap. I did detect a taste up at the restaurant where I ate, but I would not say that this was from the water or whether it was due to something in the water from the glass, washing of the glass, or whether it may have come from the ice combined with the water. I cannot say.

Q. Well, now, personally I find the Kansas City water very potable, I like it better than any water I have drunk in this country, and I go away and I find water in other places with quite a chlorine taste. How do you account for that?

A. Well, I think there are many things that can account for it. One is, you get accustomed to the water that you drink. There are many people that will not complain over the water they are drinking that people coming in from other places would complain. There are many waters that they do have taste and odor problems. And most of the taste and odor problems aren't necessarily a year-round proposition either. They may occur for certain periods of time.

Q. Doctor, you mentioned increase in the percentage or actual use of chlorine in the particular cities that you picked out for this inquiry.

What has been the general increase in the use of chlorine in other cities which you have investigated? Have they also increased substantially?

A. I haven't investigated the picture in others. I can cite that at the time of my studies in '54 and '55 that the median chlorine application of these 54 plants that were heavily-loaded plants as far as the coliform density in the raw water was concerned, that the average chlorine--the median--I will take that back--the median chlorine application was less than 30 pounds per million gallons.

Q. That means that a large number would use much less and a large number would use much more, is that right?

A. A tremendous number will be using less, I believe.

Q. And the substantial number using more?

A. There were 27 that I knew of that were using more.

Q. Well, that is about half, isn't it?

A. Of these 54 heavily-loaded plants.

Q. Yes. About half used more than the median?

A. This is correct; the median is the half point.

Q. Can you guarantee the destruction of all the pathogens in any water supply?

A. I think I probably could if I wanted to chlorinate heavily enough and provide other treatment.

Q. You don't think it is necessary, however?

A. Well, I think there is a reasonable limit. I think what you are citing at and hitting on is a field of uncertainty, and those of us that have some knowledge, there are some things we feel we don't know today and the problem of virus is one of these things of uncertainty. To my knowledge, there is some conflicting evidence that needs additional enlightenment on.

Q. Is your home in Cincinnati?

A. It is.

Q. What is the extent of the pollution of the water they use there before it gets into the intake?

A. I am trying to remember and all I have is my '54-55 data. I would estimate that the coliform density, annual density, will run some place between ten and twenty thousand. I am not sure of this because this is from memory.

Q. That is far above the 5,000 that you recommend, is it not?

A. Have I recommended 5,000?

Q. Well, that has been tossed around here as being some informal standard. What do you say about it?

A. This is a recommendation made in 1946 by the Public Health Service based on the studies of Streeter back in the 1920's.

Q. Do you agree with that?

A. I think 5,000 is a little lower than necessary.

Q. Well, how high can you go?

A. I would utilize Streeter's own data and the transfer from the indicated number to the mpn and state it around maybe 11,000.

Q. And as far as your opinion is concerned, 11,000 would be an acceptable standard?

A. I think it might be a reasonably acceptable standard, yes--pardon me. Not a standard. I will not accept the word standard for raw water for my personal feeling. It is an objective.

Q. Well, wouldn't you say that there had to be a standard that applied to all cities, a minimum standard?

A. If you say a standard, where would Kansas City get their water?

Q. Well, I am asking you about that.

A. I say it is an objective, it is desirable, something we shoot for.

Q. But not essential?

A. It is not essential. You are using water, as you just said, with 50,000.

Q. Do you recall in your examination of the city plants in making your tabulation of which ones where the worst and which were the best what was the next worst after Lexington?

A. I think I do.

Q. What was that?

A. I will not name it. This is confidential. Without permission of that plant, I will not name it.

Q. Well, did you have the permission of Lexington to name them as the worst one in the country?

A. This information was turned over to the Public Health Service.

Q. Don't you consider that all this information which the Public Health Service has for the advice of commissions such as this is the property of the public and the commissions?

A. Not under the agreement that I made in my original study.

MR. STEIN: Mr. Chairman, I would like to direct the attention of the Board and perhaps counsel to Public Health Service regulation No. 1 dealing with assurance of confidentiality.

MR. POWERS: You mean some of that is classified information?

MR. STEIN: Are you directing a question at me, sir?

MR. POWERS: You were just making a statement. I would like to have you clarify it.

MR. STEIN: I spoke to the Board. What would you like me to say?

MR. POWERS: Yes, I would like for you to clarify it. Is that classified information? You made the statement.

MR. STEIN: I did not say--it is not classified information. For your information, I suggest you may wish to examine the government system of confidential information and you might want to check on the difference between classified, secret, top secret. I am not an expert, but it is not classified.

MR. POWERS: That is all.
CHAIRMAN WILSON: Cross-examination by any other counsel?

Members of the Board?

That is all, Dr. Walton.

(Witness excused)

D. W. RYCKMAN,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. STEIN:

Q. May we have your name and address?

A. D. W. Ryckman, 1000 Joanna Avenue, Glendale, Missouri.

Q. What job do you hold, Dr. Ryckman?

A. I am the Director of the Sanitary Engineering Research and Graduate Laboratories at Washington University in St. Louis, Missouri.

Q. What degrees do you have in the field of sanitary engineering and related subjects?

A. I have a Bachelor's Degree and Master's Degree and Doctor of Science Degree.

Q. Whom does your staff include in the university, Dr. Ryckman?

A. Dr. Burbank, Professor Edgerly, Dr. Grigoropoulos, and then we have chemists and biologists on our staff.

Q. Has your group done research on organic materials of odor significance in public water supplies?

A. Yes, they have.

Q. Would you very briefly describe this work?

A. One of the extensive programs we have cooperated in is with the Missouri River Monitoring Group, which has studied the taste and odor-producing materials, the chloroform soluble materials, in the Missouri River and in the tap waters of the municipalities using the Missouri River, including Kansas City and St. Louis, and then we have made analyses for chloroform soluble materials from a number of samples submitted to us by the Region VI Public Health Service and the Water Pollution Board of Missouri.

Q. Do these odorous materials persist after water treatment given to them in the type of water treatment plant we find in this area?

A. Yes, they do. We find about the same in the tap water as we find in the raw water.

Q. Would you say that these odorous materials collected from Missouri River waters at water treatment plant intakes are resistant to biochemical removal?

A. Our research work on this subject has been rather extensive. We have found that the odorous materials which we have extracted from the Missouri River waters are extremely resistant to biological degradation under simulated stream conditions.

Q. You have heard some of the previous testimony of Dr. Walton dealing with chlorination of public water supplies?

A. Yes.

Q. Has your research indicated whether these odorous materials are resistant to removal by chlorination?

A. Yes. Yes, it has. Our studies on chlorination of these materials, odorous materials, the chloroform soluble organics, have been subjected to extensive investigation with both chlorine and chlorine dioxide, both of which are used in modern water treatment, and we have found that under concentrations of chlorine as great as 100 milligrams per litter that they are extremely resistant to transformation and retain their odor potential.

Q. Dr. Ryckman, I would like to call your attention to Government Exhibit No. 15, which is a tabular summary introduced previously, which indicates that the total chloroform extract from the Kansas Cities Metropolitan Area equals this figure. Would you read that figure?

A. The total metropolitan Kansas City--

MR. SAMSON: Doctor, just a minute. What exhibit are you referring to?

MR. STEIN: Exhibit No. 15, sir.

MR. SAMSON: And what page?

MR. STEIN: The last page?

MR. SAMSON: Thank you. Pardon me.

A. This is the total chloroform extract in pounds per day from the total metropolitan Kansas City area of 138,461 pounds.

Q. (By Mr. Stein) Are you generally familiar with the type of material referred to in this poundage?

A. Yes, I am.

Q. Would you say that is a significant contribution to the pollution load of the river?

A. Certainly as defined by odor-producing materials.

Q. As defined by odor-producing materials?

A. I would certainly say it is significant.

Q. Would you say that the methods employed by the water treatment plants are successful in removing all the pollutants of odorous significance so as to keep the Missouri River water free from odorous material when it is supplied as a finished public water supply?

A. I can easily say that we know that they definitely do not, and this is based on definite substantiated investigations.

MR. STEIN: We have no further questions at that point.

CHAIRMAN WILSON: Cross-examination? Have you any cross-examination, Mr. Powers?

MR. POWERS: No, thank you.

CHAIRMAN WILSON: Mr. Brenneisen? Any other counsel?

Members of the Board?

That is all, Doctor.

(Witness excused)

MR. STEIN: Mr. Kramer.

WARREN A. KRAMER,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. STEIN:

Q. May we have your full name?

A. Warren A. Kramer, Kramer spelled with a K.

Q. May we have your degrees?

A. I have a BS Degree and an MS Degree in majors of chemical engineering and a Ph.D Degree in Chemistry.

Q. What is your official position, Dr. Kramer?

A. Chief of Public Water Supplies, Division of Health of Missouri.

Q. In this position are you responsible for the health aspects of water treatment in the state?

A. I am.

Q. Have you ever visited the water treatment plants in Missouri taking their raw water supply from the Missouri below Kansas City?

A. Yes, sir.

Q. Do these plants have water treatment problems?

A. Yes, they do have a good many problems.

Q. Would you care to outline these briefly for the Board?

A. Well, first from the standpoint of the Division of Health, of course, we are interested in the bacterial quality of the water and any water which is as contaminated from the bacterial standpoint as the Missouri River presents any problem to a public health official.

Second, we are also concerned with the taste and odor problems that frequently occur, because they are also a health hazard in that if the public is dissatisfied with the quality of the water from the standpoint of taste and odor they are likely to seek other sources of supply which are not safe.

Problems range all the way from various descriptions you might give of taste and odor problems and also the ever-present apprehension of the bacterial quality.

Q. In your experience in the water field--and, by the way, how many years have you worked at this business, Dr. Kramer?

A. Well, I have been with the Division of Health of Missouri for 22 years and prior to that time I was with the St. Louis Water Department as assistant chemical engineer in charge of purification at the Chain of Rocks Plant.

Q. Would you say that on the basis of your experience and your examination of the Missouri plants taking water from the Missouri River below Kansas City that they have a relatively high chlorine demand?

A. Very high, yes, sir.

Q. Is this a problem?

A. Yes, it is a problem and it is an ever-increasing problem. I can recall that this chlorine demand or the amount of chlorine applied to the water to insure safe supply has steadily increased over a period of many years. Water plant operators and state officials have been concerned over it because of the fact that every year things seem to progress a little bit --become a little bit more serious. It is a thing that the water works officials, as well as the Division of Health engineering personnel, have tried to keep ahead of. It hasn't been many years ago that we thought that, for example, one-stage application of chlorine to the water was reasonably satisfactory. In order to keep ahead of this growing contamination and the apprehension as to the safety of the water, all the plants on the Missouri River later instituted a two-stage process of chlorination called prechlorination and post-chlorination and every plant that now is on the river practices that type of disinfection.

Q. These plants that you have gone to, do they have high coliform levels, would you say, in their raw water intake?

A. Yes, I would say.

Q. Is this a hazard?

A. Very much a hazard.

Q. In the plants at Lexington, Boonville, Glasgow, Jefferson City, would you say that these are relatively small staffed plants? Do they have a large staff taking care of the plants or a relatively small staff?

A. I would say a relatively small staff.

Q. About how frequently have you visited these plants and when? Do you have a routine?

A. Yes. I in the past have made it a practice of visiting all of these plants, in fact pretty nearly all of the treatment plants in the State of Missouri, at least twice a year. In recent years I have not--a good deal of that has been taken over by our field personnel, but I still visit the plants along the river and in the past year I expect I have been there about every two months.

Q. Would you say over the years of your visits to these plants that the raw water quality was deteriorating or getting better?

A. I would say it is deteriorating.

Q. Now, you have described all the processes these plants have put in for water purification. Where can they go from here? Can they put in any further methods of purification?

A. Well, that is one thing that from the standpoint of the Division of Health and of public health officials we are very much concerned about because this same thing that I recited about the chlorination process applies also to other purification processes that we employ in water purification. And likewise, at one time the plants on the Missouri River got by with what is called one-stage treatment. Now there is not a plant on the Missouri River but doesn't have at least two stages of treatment and some have tertiary treatment. And I think that that is all an indication of the water works people trying to keep ahead to supply what is considered a safe and potable water and keep ahead of this ever-growing pollution problem.

Q. In your opinion, what do you think is most needed to decrease the contamination of the raw water supply of the river and so protect the future health of the Missouri towns taking water from this river?

A. I think it has reached the point where water works officials are almost backed up into the corner. In other words we are applying everything known in the water purification field to processing Missouri River water. In other words, in common language, we are throwing the book at it. Now, where do we go from there science yet hasn't indicated, because--

Q. You--

A. Now, I would think the time has come to back up and clean up the source a little bit.

MR. STEIN: No further questions.

CHAIRMAN WILSON: Any cross-examination?

MR. POWERS: No questions.

MR. BRENNEISEN: No questions.

MR. SAMSON: I have a couple of questions, Doctor.

Q. (By Mr. Samson) You were talking about the one-, two- and the three-stage treatment of water, weren't you, Doctor?

A. That is right.

Q. Can you give the Board the benefit of any help on the difference in costs of those stages, that is approximately how much greater will the cost be for a two-stage over the one-stage or the three-stage over the one-stage and the two-stage?

A. Well, I wouldn't like to quote figures because I don't have them just off the cuff, but of course the cost of a two-stage treatment, I would say, would not quite be twice as much as the one-stage treatment, but it would be a great deal more than a one-stage treatment.

Q. And then you go into the tertiary stage, then, what does--

A. That is more cost, yes.

Q. That is more cost. Have the Lexington and the Boonville and Jefferson City works gone into the second and third stage treatment?

A. All of these plants on the Missouri River are set up for a minimum of two-stage treatment, yes, sir.

Q. Do you have any information as to when the Lexington plant went into the two-stage treatment?

A. I don't know the exact date of renovation of that plant, but it was renovated several years ago to provide that facility.

Q. And are they using the two-stage--

A. Yes, sir.

Q. --treatment now?

A. Yes, sir.

Q. Well, in the last five years, would you say?

A. Yes.

Q. How about Boonville?

A. Boonville?

Q. Yes.

A. Pretty much the same. Boonville built a new plant, but in lieu of discarding the old plant they use a great portion of the old plant as the so-called primary or first-stage treatment and are using the new plant more or less as a second stage of treatment.

Q. Do you have any information as to what the cost of the new plant was--

A. No, sir.

Q. --as compared to the second-stage treatment?

A. I wouldn't say.

Q. But you would say probably in the neighborhood of--I will withdraw that. Is there any health hazard or health danger in connection with the excessive use of chlorine?

A. Well, as far--chlorine is a very active chemical. It is one of the most active chemicals known. We know it is a very hazardous chemical to handle. In the quantities that we think of it that are used in water purification for control of bacteria and taste and odor problems, why, as far as known those concentrations are not hazardous to health, but I think there is a good deal yet to learn about that.

Q. In other words, you are getting into a field of speculation when you get into large quantities of chlorine and the effect that it has upon the human body, is that right?

A. Yes, sir. We are getting into dosages of chlorine now that it just almost is impractical and dosages carrying residuals in the finished water are relatively high and I don't think--whereas we have no evidence at the present time that the residual chlorines carried in the public water supply at the present are deleterious to health, over a long period of time we don't know exactly what these high concentrations might do.

Q. Might you get to the point as far as concentration is concerned where the water would be unpotable, would not be potable?

A. Yes, sir, that is possible.

Q. And what is your judgment on what concentration that would be?

A. Well, at the present time some of the plants are carrying what is termed as high as two parts per million of chlorine in the finished water, and I would say that is getting up pretty much to the top, because anything over that is likely then to give you a pretty chlorinous taste. I mean you begin then to get the odors and the taste of the chlorine itself when you get into dosages much above that.

Q. Well, then, in other words, Doctor, these plants at Lexington and Boonville and Jefferson City have in the last ten years gone into second-stage treatment?

A. Yes, sir.

MR. SAMSON: That is all. No further examination.

CHAIRMAN WILSON: Any other members?

MR. JOHNSON: Yes, Mr. Chairman.

Q. (By Mr. Johnson) Dr. Kramer, I wonder if it is possible for you to give us any estimate at all between the cost of operating water plants such as we have mentioned on the Missouri River, Jefferson City, Boonville, and so on, and outstate plants that don't have this problem such as, we will say, Springfield?

A. Well, I tell you, there are just so many local factors that come into a picture of that sort that I would hesitate to even give you a figure off the cuff.

Q. I was simply asking for percentage.

A. I am positive that the chemical dosages, including the disinfection agents, that are necessary for rendering raw Missouri River water into a potable supply are pretty excessive.

Q. Much more so than outstate?

A. Yes, that is right.

MR. JOHNSON: Thank you.

CHAIRMAN WILSON: Any other questions?

Q. (By Chairman Wilson) Doctor, righ along that same line, may I ask you if you are familiar with the municipal and industrial sources of pollution of the Missouri River and its tributary, the Kansas River, which we have under consideration in this case? Did you hear them described as to their geographical location by Mr. Kittrell this morning?

A. I was here for only a part of Mr. Kittrell's testimony, sir.

Q. Well, he described the metropolitan area from which the sources of pollution or where the sources of pollution were located as including the two Cities of Kansas City, Kansas, Kansas City, Missouri, North Kansas City, Missouri, the Fairfax Industrial or Drainage District north of Kansas City, Kansas, on the river, and a small area some drainage district or suburban district south of Kansas City, Kansas. Are you familiar with these sources of sewage and industrial wastes from that area?

A. Well, sir, I live in Missouri and all of my work is in Missouri and I don't care to stray off of the reservation.

Q. Well, I mean do you have a general idea of the character and volume of the pollution coming from that area?

A. I have a very good idea what comes down the Missouri River below Kansas City and what the water plants have to contend with. Now, just exactly where it comes from and what outlet or what sewer, I couldn't tell you.

Q. What I am leading up to is this, more or less along the line of the question that was asked of you by Mr. Johnson. He asked you to make a comparison between the degree of treatment of water for water supply purposes that was required on the Missouri River with inland towns who don't have to struggle with water having the high concentration of pollution load.

A. Yes, sir.

Q. Now, the question I want to ask you is whether the requirements for degree of treatment which you say these plants along the Missouri below this metropolitan area are now required to apply would be reduced if adequate treatment according to known and generally used methods were applied to these sources of pollution in this metropolitan area?

A. Yes, I think it is a reasonable assumption that if the pollution load is reduced that the treatment facilities could be also reduced based on the fact that out of state plants are not having the problems or required to use the excessive dosages of chemicals for processing the water that are used on the Missouri River.

Q. Then it is your opinion that the effort and the cost of water treatment which these downstream communities now have to apply would be substantially reduced if there were adequate treatment of the sewage and industrial wastes in this Kansas Cities Metropolitan Area?

A. Yes, I feel that way. And I feel further that it would not only reduce the cost from an economic standpoint, but the hazards to health as well as the anxiety of having to have this thin line between pollution and good health.

CHAIRMAN WILSON: Any other questions?

That is all.

(Witness excused)

MR. STEIN: Mr. Hedges.

RALPH C. HEDGES,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. STEIN:

Q. May we have your name and address, Mr. Hedges?

A. Ralph C. Hedges, 6140 Mission Drive.

Q. What position do you--

CHAIRMAN WILSON: How do you spell that last name please?

A. Hedges, H-e-d-g-e-s.

Q. (By Mr. Stein) What position do you hold, Mr. Hedges?

A. I am president of Mid-States Marine Distributors, Incorporated, and vice-president of the Greater Kansas City Marine Dealers Association.

MR. SAMSON: Pardon me. Mission Drive, is that Kansas City, Kansas, or Kansas City, Missouri?

A. Mission Hills, Kansas. Kansas City 15, Missouri, post office.

MR. SAMSON: Thank you.

Q. (By Mr. Stein) What was that association you are vice-president of again?

A. The Greater Kansas City Marine Dealers Association.

Q. What is the gross business that the Greater Kansas City Marine Dealers Association do in this area a year?

A. We estimated recently, the association, that association members in excess of ten million dollars annually.

Q. Has your association plans for a recreation area in this area?

A. Yes. We have a proposed marina to be built on city property at the Paseo Bridge.

Q. Would you mind pointing out the location of that on Government Exhibit No. 18?

A. It is not on this map.

MR. STEIN: Let's have Government Exhibit No. 15.

Q. (By Mr. Stein) Would you point to Paseo Bridge on that map?

A. It is the area on the south bank of the Missouri River between the Kansas City Power and Light Company plant and the Paseo Bridge, right at this location here (indicating).

Q. What would be the approximate cost of this installation?

A. We haven't completed engineering studies yet, but it was estimated that it will be approximately three-quarters of a million dollars.

Q. Have you got a projected artist's conception of that project?

A. Yes.

Q. May I have it? Is this in the form of an artist's drawing and photograph?

A. Yes, it is an aerial photograph of the area with an artist's conception superimposed on the aerial photograph.

MR. STEIN: I ask that this be identified for purposes of identification as Government Exhibit No. 61.

(Government's Exhibit No. 61
marked for identification.)

Q. (By Mr. Stein) Will you briefly describe this project?

A. The area that the proposed marina would be located on is approximately 1,200 feet square and the water portion is approximately 500 feet square.

At the south end or the left side of the picture there would be a 500-foot wide loading ramp that would facilitate unloading of boats by trailers. The other part of it would be gas facilities and also places to keep boats overnight, storage. Overlooking the river would be restaurant facilities. There would also be other facilities for maintaining boats, finishing boats.

MR. STEIN: I would offer this at this point as Government Exhibit No. 61.

CHAIRMAN WILSON: Any objections?

Received.

(Government's Exhibit No. 61 received in evidence.)

Q. (By Mr. Stein) Have you ever boated yourself on the Missouri River?

A. Yes.

Q. In and about Kansas City?

A. Yes.

Q. Would you describe the conditions of the water as being clean in this area?

A. Well, it is a long cry from being clean and we have boated extensively on the Kaw River up to 7th Street by the Turkey Creek outlet and it is a pretty bad situation at low water or high water, the smell and odor at that particular point. Also I have boated on the Blue River and that is at places almost a solid cesspool. Boating on the Missouri River, of course, is not as bad as these two points, but it is certainly disgusting.

Q. Have you ever seen people water skiing in those areas?

A. Yes.

Q. Now, do you believe that the projected marina and recreation area you outlined and as depicted in Government's Exhibit 61 would be helped if we had relatively clean water in this area?

A. Yes, it would not be completely essential to it, but it would almost be a criteria in order to make a successful marina development to have clean water, certainly substantially cleaner than at the present time.

Q. Would you believe similarly that clean water of this type would help the marine business in this area?

A. Yes. At the present time the people that have power boats in this area or boats to do any type of family boating would have to go to the Lake of the Ozarks, approximately 125 miles.

Q. About how many power boats are there in this area?

A. According to OBC statistics, which is the Outboard Boating Club of America, approximately 25,000 in Kansas City.

Q. Would you believe that more of these would be put into the Missouri River and the Kansas River if the waters were cleaner?

A. Very definitely. It would be very definitely a boost to the boating and sporting goods business in Kansas City.

Q. About how far from here is the Lake of the Ozarks?

A. Approximately 125 miles. It will vary as to where you go on it.

Q. How do the people get their boats to the Lake of the Ozarks?

A. They trail them down, take them down on boat trailers.

Q. Is this kind of a bother and a chore to get them down there?

A. Yes.

Q. Is it expensive, relatively?

A. Yes.

Q. Now, how about the other lakes around this area? Are there any other lakes to be used other than the Missouri River if someone doesn't want to go to the Lake of the Ozarks?

A. Yes, there are a few smaller lakes, Prairie Lee Lake, which is owned by Jackson County, Jacomo, which is the largest-sized lake in this area, but that is restricted to ten horsepower, which eliminates most of the boaters. There are other lakes in Kansas, but all small and very inadequate for any type of boating.

MR. STEIN: We have no further questions.

CHAIRMAN WILSON: Counsel, cross-examination?

CROSS-EXAMINATION

BY MR. POWERS:

Q. Mr. Hedges, do you prefer to do boating on clear water or muddy water?

A. At the present time we prefer boating on almost any kind of water we can get.

Q. A lot of these people that put their boat on a cart--which you probably sell them, don't you, you sell the carts--

A. Yes.

Q. --as well as the boats.

A. Yes.

Q. --and go down to the Lake of the Ozarks or one of the other lakes, part of their interest is in getting away from the city, isn't it, for the week end?

A. That is correct.

Q. Your project, I understand, is going forward regardless of the condition of the river, is that correct?

A. Its success to a great degree will determine the condition of the river.

Q. You intend to go ahead with it, though, don't you?

A. Yes, we hope to.

MR. POWERS: That is all. Thank you.

CHAIRMAN WILSON: Any other questions?

MR. BRENNEISEN: Yes.

CROSS-EXAMINATION

BY MR. BRENNEISEN:

Q. Mr. Hedges, do you believe the success of this projected marina is worth between seventy-five and a hundred million dollars to the taxpayers of Kansas City, Kansas, and Kansas City, Missouri?

A. We hope to have it cost the taxpayers very little. We hope to make it a self-liquidating project.

Q. Didn't you say that the success of it was dependent upon this river being cleared up?

A. Part of the success of it, yes, would be on the clearing of the river up, because not very many people like to boat in polluted water.

Q. Suppose it cost between seventy-five and a hundred million dollars to clear the river up. Do you think the success of that marina is worth it?

A. Well, I would say that the success of Kansas City would be worth cleaning the river up and this would be a by-product of it.

Q. You won't say, though, that the success of the marina is worth that?

A. Actually, the success of the marina is a by-product of the success of cleaning the river up.

Q. You don't want to answer my question?

it would be useless to make a one-day trip. The Lake of the Ozarks it is possible to--it is a three and a half hour trip down there with a boat behind you. By the time you take three and a half hours down and three and a half hours back, you have had an awfully long day and a very short boating time. Where people here in Kansas City in the immediate area can within an hour be at their site of boating or less and boat all day and the length of boating would be extended considerably by the person that owns the boat.

Q. Well, what I am trying to get at, bear in mind that some of the members of this Board, like myself, come from quite a long distance and we are not familiar with your water situation except as we have seen it right here on these rivers. What I am asking is if added up all together you have got within a radius of single-day use of this city enough water outside of these rivers to provide an adequate opportunity for all the people that have boats in this community or in this metropolitan area?

A. I would say no.

A. In order to have that opportunity they must use the rivers?

A. Yes.

Q. That is the largest water opportunity around here?

A. That is right.

Q. And if the pollution were cleaned up it would be much more suitable for that purpose?

A. That is correct.

CHAIRMAN WILSON: That is all.

(Witness excused)

MR. STEIN: Mr. Hartung.

HERBERT O. HARTUNG,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. EDELMAN:

Q. Will you give your full name for the record, Mr. Hartung?

A. I am Herbert O. Hartung. I live in St. Louis County.

Q. By whom are you employed?

A. I am employed by the St. Louis County Water Company and the Missouri Water Company both. I am executive vice-president of both organizations.

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A. I am Herbert O. Hartung. I live in St. Louis County.

Q. By whom are you employed?

A. I am employed by the St. Louis County Water Company and the Missouri Water Company both. I am executive vice-president of both organizations.

Q. What professional training have you had, Mr. Hartung?

A. I am a graduate sanitary engineer from the University of Kansas and Fellow in the American Academy of Sanitary Engineers.

Q. Are you a registered professional sanitary engineer in Missouri?

A. Yes, I am.

Q. Can you describe the operations of the St. Louis Water Company?

A. Yes, I am familiar with the operations.

Q. Will you do so?

A. Well, the St. Louis County Water Company operates two water plants, taking its water--or operates three water three water plants, taking water from the Missouri River for two of the plants and the third takes its water supply from the Meramec River. We serve in this company the environs of a suburban area of St. Louis serving about 675,000 people in an area that is, oh, about three times the area of the City of St. Louis. At the Missouri Water Company in Lexington we serve about 5,000 people and take the water from the river at mile 321. We also have an operation here in Independence, Missouri, but that company takes its water from wells which are drilled adjacent to the Missouri River 17 miles downstream from the Main Street wharf here in Kansas City.

Q. Have these companies or have you in your position with these companies noted any increase in pollution in the Missouri River in recent years?

A. Yes, the St. Louis County Water Company and the Missouri Water Company both have been increasingly concerned with the amount of pollution in the Missouri River. Although the St. Louis County Water Company and the Missouri Water Company of Lexington, Missouri, have been able to serve a satisfactory water and a safe water to their customers at all times, this has only been possible because of added purification facilities, added method and added attention to water purification details, which was not required in former years.

Q. Will you describe the condition as you are aware of it in St. Louis with respect to pollution of the Missouri River?

A. The full quantity in the Missouri River is insufficent to dilute adequately the untreated domestic sewage and industrial wastes now being discharged into the Missouri River. That pollution has caused a deterioration in the water supply which we are required to treat in our plants. In addition if pollution in the Missouri River continues to increase as it has in the past, the Missouri River as a drinking water source may become seriously substandard. This causes us some concern for the future. Public water supply treatment plants as now constructed and now designed are not capable of treating unlimited amounts of pollution. There is a limit to what you can put through the present type of water treatment plant. This is somewhat analogous to the fact that the water treatment plants can't treat brine water adequately or sea water adequately. There is another analogy that exists here pertaining to water treatment costs. It is not economical to treat water that has unlimited amounts of pollution in it any more than it is economical to treat brine water and sea water for public water supply use.

Q. Have you noticed any other effect of this pollution on your operations, Mr. Hartung?

A. One very important index of this pollution in this Missouri River is the very noticeable and obnoxious, objectionable type taste and odors which appear from time to time in the Missouri River. Now, occasional processing of the Missouri River water to remove these tastes and odors has been, oh, necessary for as long as 15 years, but in recent years we have had to do quite a bit more of those, that type of treatment. Since about 1954 the number of days on which the extensive taste and odor removal processing was required has increased, oh, about ten times over that which we had prior to 1954. I might emphasize here that this extensive intensive taste and odor treatment processing isn't a daily process. It depends upon such things as the quantity of the water in the river, the amount of biological activity that is going on in the river, the temperature of the water and a lot of factors of that kind.

Q. Have you had access to laboratory analytical data showing deterioration of the Missouri River quality and other aspects of its condition?

A. Yes. Ammonia, which has been normally zero, at times now, especially in the winter periods when biological activity is low, gets as high as 1.2 parts per million. Chloroform soluble organics, which are normally at St. Louis 20 to 40 parts per million, have been as high as 160 parts per billion. Chlorine demand has been normally four to five parts per million, a threefold increase. Grease and oil slicks are more frequently noticeable. Foam is also noticed occasionally on the river. At Lexington we have had to on occasion dip grease balls and other kinds of objectionable debris from the basins as a part of the water purification plant processing.

Q. Do you know whether Lexington has ever had to shut off its intake pumps to avoid slugs of pollution, Mr. Hartung?

A. Yes. I might preface that by another remark. The Corps of Engineers on occasion has notified us through the U. S. Public Health Service, who have been our direct contact, that there are noticeable oil slicks immediately downstream from Kansas City carrying very heavy taste and odor potentialities. We have been able to correlate taste and odor problems all the way down to St. Louis County with those reports of oil slicks and taste and odor potential as reported by the Corps of Engineers. During these same occasions at one or two times we have had to shut down the intakes at Lexington entirely to let this oil slick or these taste and odor producing materials go by and serve the customers out of reserve storage.

Q. Are you a member of a committee known as the Missouri River Pollution Monitoring Committee?

A. The Missouri River Pollution Monitoring Committee is a task force of water works operators between Yankton, South Dakota, and St. Louis and I am a member of that group.

Q. Are they interested in the quality of Missouri River water?

A. Yes, they are. And they have been measuring the Missouri River water at their respective intakes for chloroform soluble organics.

Q. Will you tell us what these measurements have indicated to the members of the committee?

A. Well, for example, in the years 1958 and 1959 the chloroform soluble organics immediately upstream from Kansas City have averaged about 5,000 pounds per day, that is 5,000 pounds per day on the basis of our measurements and the methods in which we recover them. Down at St. Louis the chloroform soluble organics have average 17,000 pounds per day, which is over a threefold increase compared to what is above Kansas City.

Q. Mr. Hartung, earlier in your testimony you indicated that Independence, Missouri, obtains its water from wells. Isn't the Missouri River right on its doorstep?

A. Yes, it is. This water treatment plant at Independence was constructed in 1956, that is at Liberty Bend or mile 361 on the Missouri River. We went to wells at that particular location on the advice and instruction of the Missouri Division of Health that the river at this point was polluted, and in addition we made our own investigations and studies and substantiated that it would be in the interests of that community to abandon the Missouri River as a source of supply and go to wells instead.

Q. If the Missouri River at this point were substantially less polluted, would you consider it to be an adequate source of water for independence?

A. Yes, if it was less polluted it would be an adequate source of supply.

Q. On the basis of your experience with the processing of Missouri River water, what do you think the future is or the future holds for the water treatment plants on this river with respect to the quality of Missouri water?

A. I can't--I am not a crystal gazer. I certainly am of the opinion that pollution should not be allowed to increase over what it is at the present time and in the interest of Downstream water users I think that pollution abatement should be put into effect as soon as possible.

MR. EDELMAN: We have completed direct examination.

CHAIRMAN WILSON: Cross-examination, counsel?

MR. POWERS: No questions.

CHAIRMAN WILSON: Any other counsel?

Members of the Board?

MR. SAMSON: I have a question or two.

Q. (By Mr. Samson) Is it Doctor, Dr. Hartung?

A. No, I am just an engineer.

Q. Mr. Hartung. Fine. Where did Independence get its water, its potable water, prior to the construction or the digging of the wells?

A. We wholesaled that water from Kansas City, Missouri.

Q. In other words, at no time has Independence taken its domestic water supply from the Missouri River?

A. No; that is not quite adequate. Years ago prior to the present ownership the Independence Water Company did have an intake and water treatment plant downstream from Kansas City and it was abandoned.

Q. Do you recall about when that was abandoned?

A. No, I don't remember the exact dates. It was prior to the present owner's time with this company.

Q. Well, would it be in the past ten years, within the past ten years?

A. No, it would be longer than ten years.

MR. SAMSON: I see. I have nothing further.

CHAIRMAN WILSON: Other questions?

MR. POOLE: I have one for my curiosity.

Q. (By Mr. Poole) Did you say 625,000 people in the St. Louis area that your company serves?

A. 675,000 people.

Q. And your figures for the years of 1958 and 1959 for chloroform soluble materials were in round numbers 5,000 pounds a day upstream from Kansas City, 17,000 pounds a day at St. Louis.

A. That is right. Now, this does not represent the amount that is contributed to the river. It may not even represent the amount that is in the river. It is the amount that we recovered by standardized testing techniques.

CHAIRMAN WILSON: Are you through?

MR. POOLE: Yes.

Q. (By Chairman Wilson) In making this comparison are you referring to samples taken at the vicinity of St. Louis from the Missouri River?

A. Yes, I am.

Q. So that the difference in these figures between the point tested above the Kansas City area and the point where the sample was taken at St. Louis represents the pollution load that got into the river between those points?

A. It is a representation of the pollution load between these two points.

Q. You are not including anything in the Mississippi River?

A. I am not.

Q. Opposite St. Louis?

A. I am not.

CHAIRMAN WILSON: All right. Any other questions?

That is all.

(Witness excused)

CONWAY BRISCOE,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. STEIN:

Q. May we have your name and address?

A. Conway Briscoe, 903 Bellerive, St. Louis 11, Missouri.

Q. What is your position, Mr. Briscoe?

A. Water Commissioner with the City of St. Louis.

Q. Are you a registered professional engineer?

A. I am.

Q. Since when have you supervised the operation of the water division in St. Louis?

A. February of 1957.

Q. Where does your water plant in St. Louis City obtain its water?

A. We obtain one-third of it directly from the Missouri at Howard Bend and two-thirds from the Mississippi at the Chain of Rocks plant. However, that is a little misleading because the Chain of Rocks is located on the west side of the Mississippi directly below the confluence with the Missouri and the result is that we get our water virtually--our community is virtually dependent upon Missouri River water.

Q. In the processing of your water at St. Louis have you noticed an increasing severity of taste and odor difficulty?

A. Yes, we have.

Q. To what do you attribute that?

A. In part to the reduced silt load that the river has been carrying since the installation of the major stem dams. And, of course, that results in a reduction in the absorptive powers of the river water.

Q. Absorption powers of the river water to absorb what?

A. Many forms of impurities.

Q. Do you estimate that these impurities might come in the water from large municipal and industrial concentrations upstream?

A. Judging by the simultaneous increase in our taste and odor difficulties, there is every indication that particularly some industrial wastes contribute quite heavily to our problem.

Q. Do you regard this as a definite condition of your raw water supply that you are going to have to cope with?

A. Yes, we have We have been forced by the results in our community to give increased care to checking the taste and odor quality of our water and taking remedial steps.

Q. If this same condition is allowed to continue, do you think it might provide difficulties to you to supply all the water that is needed by your customers in St. Louis and at the same time properly protect your community?

A. I do.

MR. STEIN: No further questions.

CHAIRMAN WILSON: Any cross-examination?

Members of the Board?

MR. SAMSON: I have a question or two.

Q. (By Mr. Samson) Mr. Briscoe, when you refer to St. Louis do you refer to St. Louis, Missouri?

A. City proper.

Q. And is any of this water used over in Illinois?

A. No. Nor practically none of it in the county. It is practically all within the city limits. There are very few accounts in the county who are served.

Q. Your problem down there with the water is primarily one of taste and odor?

A. Let's put it this way. That is the most aggravated recent factor, taste and odor.

Q. You have been with the City of St. Louis or with the Water Commission since 1957?

A I have been with the city as Director of Utilities eleven years prior to that and as such the water division was under my direction.

Q. I see.

A. But not under my detailed direction until I stepped down and took that in '57.

Q. Have you noticed any change in the quality of the water during those past eleven years?

A. We have had--yes, our records that go over my desk indicate almost in step with the construction of the dams and the clarification of the water an increased taste and odor problem on our plants. Our records of the use of carbon will bear that out as well.

Q. Do you use an activated carbon filter--

A. No, sir.

Q. --on some of your testing?

A. We do, but that is not a complete solution because generally you are in hot water before you know it.

Q. How do you mean that?

A. Well, I mean that our difficulty is upon us before our carbon starts to work. And where you have a large system like that, you are in difficulty. As far as I know, we haven't been able to locate any instrument, outside of the advice that we received from the state board, that gives us any drop on the problem.

Q. But you noticed, then, in the last eleven or twelve years that there has been a constant--

A. No, I won't say that I noticed. The records of the department are in a matter of four or five years, five years. It doesn't go back too far and it starts simultaneously with this reduced silt flow.

Q. And the problem you refer to is primarily taste and odor?

A. That is the problem I have referred to. That is not the whole problem.

Q. Well, can you tell us in just a few words what the rest of the problem is?

A. I can't, because I am not capable of it. But there are reliable reports that go over our desk all the time of materials that are very subtle that we do not--are not capable of checking that have at certain places very bad effects upon a community, certain chemicals and the like of that. And those are a continual worry to us because our obligation is not only to give the community a water that tastes good but one that is good for them. And if we are really not too well set up to check these matters, of course the prime responsibility may lie with the health department and all of that and we could probably shrug our shoulders to it, but we are not about to do that if there is any way to get out of it.

MR. SAMSON: I believe that answers my question. Thank you very much.

MR. POWERS: May I ask a question?

CROSS-EXAMINATION

BY MR. POWERS:

Q. Can you enumerate the dams that you have referred to that have reduced the silt and caused more odor to be carried down?

A. No, I don't believe I can. I could get you the record on that. But for me to enumerate the dams and say this dam caused this silt reduction would be a little presumptive. I don't claim to be able to do that.

Q. You mean you are starting with the Fort Peck Dam?

A. I am starting with a condition that was in a little less than five years ago. Now, we can correlate that with the dam, which I have done only generally, but our records starting about five years ago is when we began to get hit. I understand that that corresponds with the functioning of the dams.

Q. Does that have an relation to the presence of algae in the water?

A. I am not capable of answering that too well, but my impression from what I read and learn is that it does.

MR. POWERS: Thank you.

MR. POOLE: May I ask a question?

CHAIRMAN WILSON: Mr. Poole.

Q. (By Mr. Poole) I have heard a good deal of testimony here in the last two or three days, Mr. Briscoe, about the increasing load or the increasingly worsening condition of the river. Now you seem to be putting a lot of your troubles at St. Louis on the installation of the dams and some clarification of the river water as a result of that. Could it be that there has been an increased load on the river that has been simultaneous with the installation of these dams?

A. I not only think there could be, I think there is. But I also feel this way, that in any project as sound as those dams, which from an over-all standpoint of flood control and power are certainly sound, may at the same time have some minor negative features and one of those, in my estimation, has been the reduction of the silt load. Now, there is no quarrel with the project, but there is reason to feel that an equitable solution or an effective solution will have to be founded on a technically sound program and also one that involves all factors on an economically fair basis. In other words, if there is a contributing factor in the result of this silt load and if it should come from the dam program, it should not be overlooked. And I think the evidence here that is much more ably presented than I can do can be shown to indicate quite clearly that the water has come to us in a clear-appearing state and yet presented to us greater difficulties from a treatment angle.

CHAIRMAN WILSON: Any more questions?

Q. (By Chairman Wilson) Mr. Briscoe, along with this increase in your taste and odor problems that you have noted in recent years, what has been the situation with respect to your problems of treatment of your water from bacterial contamination?

A. We have stayed ahead of it, but it has increased as well.

CHAIRMAN WILSON: Any other questions?

That is all.

(Witness excused)

I. H. REED,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. STEIN:

Q. May we have your name and address, Mr. Reed?

A. I. H. Reed, 124 Boonville Road, Jefferson City, Missouri.

Q. What is your position, Mr. Reed?

A. I am president and general manager of Capitol City Water Company, 315 Madison Street, Jefferson City.

Q. Is that the public water supply at Jefferson City?

A. Yes, it is. Capitol City Water Company is a private utility company furnishing the public supply to Jefferson City and certain adjacent areas.

Q. Does your plant use Missouri River water as a source of raw water supply?

A. Yes, it does. The Missouri River has served as the source for raw water supply for Jefferson City since 1888 when the first plant was built.

Q. How does the water quality of the Missouri River as you take it in influence your plant in its operation?

A. Well, the company is now and has been delivering to its customers a safe and potable water. This has only been possible, however, through added methods of treatment through the years, purchase of equipment and, of course, increasing costs in the water purification. These additional methods of treatment, and so on, have occurred as the demand and as the chemical and bacteriological characteristics of the raw water have changed.

Q. Would you say that over the years the condition of the raw water is getting better as it goes past your plant?

A. No, I am afraid I couldn't say that.

Q. Have you ever had to shut down your plant because of the polluted quality of the raw water?

A. In the past few years during periods of severe conditions in the raw water we have applied all known processes of water purification and we have at some few times closed our low service pumping plant until these slugs would pass our intakes. However, our plant capacities are not capable of closing down the low service pumps for any long period of time.

Q. Does your firm have any continuing concern about the quality of the Missouri River water which you use as a source of raw water supply?

A. Yes, we do. As the untreated domestic sewage and industrial waste materials discharged into the Missouri River upstream from Jefferson City have increased we have noticed that the quality of the raw water is consistently deteriorating. Our intakes are located upstream from any discharge of sewage or industrial wastes by Jefferson City. Taste and odor problems have developed until they are an extremely troublesome factor in processing the raw water into a safe drinking water. In 1948 the super or break point chlorination process was added to the treatment facilities in an effort to alleviate taste conditions in the finished water.

MR. SAMSON: The what was that, did you say?

A. Prechlorination, break point chlorination.

MR. SAMSON: What do you mean by that?

A. Well, it is adding chlorine ahead of the finished water. Presently we are applying it after our coagulants and then it goes into a settling basin and then into the filters and then if required postchlorination is added. In 1959 the chlorine demand did not fall below a minimum of 50 pounds of chlorine per million gallons of water and on occasions the maximum per day was in excess of 111 pounds of chlorine per million gallons of water. And at times during the maximum days it was necessary to feed more than at the rate of 120 pounds of chlorine per million gallons of water to meet the chlorine demand.

CHAIRMAN WILSON: Any cross-examination?

CROSS-EXAMINATION

BY MR. POWERS:

Q. What were those times, Mr. Reed, when you had to use so much chlorine?

A. I don't know whether I can recall the--

Q. What kind of a situation?

A. It would be a taste and odor situation.

Q. What was the stage of the river? Did that have anything to do with it?

A. Not too much.

Q. What was your reference to floods, flood stage?

A. I beg your pardon?

Q. What was your reference to closing down the plant in flood stage? Did I understand that correctly?

A. It wasn't in flood stage. It was not in flood stage.

Q. Well, what were the occasions when you did close it down?

A. When there would be excessive pollution in the river and we knew from contacts upstream that it was on its way and as it would reach our intakes we would close down for a few hours until maybe the excessive pollution might pass.

Q. A few hours?

A. Yes.

MR. POWERS: Thank you.

CHAIRMAN WILSON: Any other questions?

MR. SAMSON: Yes. Are you through, Mr. Powers?

MR. POWERS: Yes, thank you.

Q. (By Mr. Samson) Mr. Reed, what was the nature of that pollution that caused you to close down? Did you examine it?

A. No. Usually or at times when it is very bad the plants upstream will notify us that it is coming and we describe it actually as just slugs. We don't know what it is. It is slugs of pollution and contamination that is greater than normal times.

Q. Well, would you observe it as it came down past your plant?

A. Yes, our operators would. I don't know what it contained.

Q. Now, referring to this to meet the chlorine demand, you stated that at times you used 120 pounds of chlorine per million gallons of water. Do you remember whether that is during periods of time that there is excessive runoff?

A. No, I don't, without referring to our records. We will have--just recently we spent over $4,000 in additions to our laboratory in order to better control this situation, which we feel is becoming more and more serious.

Q. Because of what reason?

A. In order to control the situation and test the--make better control of the tests on the raw water.

Q. That is laboratory equipment that you have spent over $4,000 for?

A. Yes.

Q. And that is in connection with taste and odor problems?

A. Yes.

MR. SAMSON: No further examination.

CHAIRMAN WILSON: Any other questions?

That is all, Mr. Reed. Thank you.

(Witness excused)

CHAIRMAN WILSON: We will take our afternoon recess for fifteen minutes.

(RECESS)

CHAIRMAN WILSON: The hearing will come to order.

Proceed, Mr. Stein.

MR. STEIN: Mr. Jeans.

HERBERT JEANS,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. STEIN:

Q. Would you give us your name and address, Mr. Jeans?

A. Herbert Jeans, 1707 Ridgmont, Columbia, Missouri.

Q. Do you ever go duck hunting on the Missouri River?

A. Yes.

Q. Where do you duck hunt?

A. Between Boonville and Jefferson City.

Q. Have you ever seen any grease in the river?

A. Yes.

Q. Where do you see that, on the surface?

A. On the water surface.

Q. What has it got the appearance of?

A. Well, it is just in whole big gobs of grease.

Q. Have you been duck hunting any particular time of the year?

A. I usually hunt quite a bit during the duck season, which normally opens the latter part of October and runs to about the first of the year.

Q. Were you duck hunting last duck season?

A. Yes, sir.

Q. Do you hunt from a blind?

A. That is right.

Q. About how long do you spend in the blind when you go out duck hunting?

A. We usually spend the morning. We usually get in there about fifteen minutes before the opening of the opening hour of the season, of the day, which last year was sunup; the year before it was a half an hour before sunup.

Q. When do you generally leave?

A. We usually hunt until noon.

Q. Until noon. Sitting in a duck blind did you ever detect any unusual odor on that river?

A. Yes, sir.

Q. Would you describe that?

A. It smells just like you was near a sewage disposal plant.

Q. Do you think it would be more pleasant sitting in that blind waiting for those ducks to fly over if you didn't have that smell?

A. Sure.

MR. STEIN: No further questions.

CHAIRMAN WILSON: Any cross-examination?

MR. KOENIGSDORF: No questions.

Q. (By Mr. Samson) Mr. Jeans, do you cook in your blind?

A. Yes, sir.

Q. And what kind of a stove do you use?

A. We use a--we used to use a charcoal burner. Last year we got us a little bottled gas stove and put in our blind.

Q. In other words, it is first class out there on the river?

A. We are as first class as we can get.

Q. You cook your breakfast out there and your lunch, do you?

A. Yes, sir.

MR. SAMSON: That is all.

CHAIRMAN WILSON: Any other questions?

That is all.

(Witness excused)

EARL COLEMAN,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. STEIN:

Q. May we have your name and address, Mr. Coleman?

A. Earl Coleman, 1208 North Osage, Independence, Missouri.

Q. What is your position, Mr. Coleman?

A. I am wild life conservation agent for the State of Missouri, assigned to Jackson County.

Q. Would you indicate on Government Exhibit No. 13 behind you where your assignment takes you to the Missouri River?

A. Well, my assignment goes from--it includes all of Jackson County from just downstream from the Kansas River and down to the county line, Lafayette County line, which is just upstream from Napoleon, Missouri. It includes the water front through Kansas City.

Q. Have you ever seen any grease in the river?

A. Grease?

Q. Yes.

A. Yes, sir, in large quantities.

Q. Does it ever get on any of the boats that you have seen on the river?

A. Yes. I might say that there are two types of this grease or tar. First of all, especially during the wintertime and during the duck season, every eddy and backwater on the river will be completely covered with a greasy substance similar to that you might have on dish water that had been left in the sun for a week or so. In addition to that, there are large chunks, perhaps the size of a man's hat, of a tarry substance, it is a solid deposit on the sand bars;occasionally you see it floating in the river. You run a boat down the river and back, as I did one day last winter in November when the river was low, it will take an hour to an hour and a half to clean the boat up and motor. On this one particular trip that I mentioned, when I came in all the part of the motor that was in the water and all of the part of the boat was covered with that tarry substance. I used a full box of detergent and about an hour's effort with a scrub brush to remove it.

Q. Have you ever noted any fishing in the river?

A. There is very little fishing activity in the Missouri River at the present time. There are only about a dozen commercial operators that I know of fishing from Jackson County. The fish markets here in Kansas City tell me--of course this is hearsay--but they tell me that they won't buy fish from the Missouri River in this area if they know it because of complaints of people who state that the fish have an undesirable oily taste.

Q. What would you say is the main reason that sports fishermen don't fish in that river?

A. Well, I think there are a lot of fish in the river, but it is the undesirable surroundings that you encounter when you go on the river in a boat or out on the sand bars. You can walk out across a sand bar, you have to dodge these tarry deposits that I mentioned. Then the oil on the river, the undesirable odors. A trotline fisherman might have to take a half a dozen contraceptive devices off his trotline before he got to his fish. Just the filth that is there.

Q. Did you ever pick up a commercial fisherman's net to examine it for license number and mesh?

A. Yes, I have.

Q. Do you ever find any foreign substances on that?

A. Yes, we do.

Q. Are these about the same or would you care to describe them?

A. Well, you will find rubber contraceptive devices, all kinds of vegetable and garbage refuse, of course the tar and oil and that sort of thing.

MR. STEIN: Thank you, Mr. Coleman. No further questions.

CHAIRMAN WILSON: Any cross-examination?

Members of the Board?

MR. SAMSON: I have a question or two.

Q. (By Mr. Samson) In connection with this grease and the large chunks of fatty substance that you say you found, in what part of the river do you find that? I mean can you localize it, Mr. Coleman, as to whether it is down near the far end of your work or up toward Kansas City and the metropolitan area here?

A. I have observed it on the sand bars at low water stage from the Truman Bridge, which is a railroad bridge across the Missouri River, down to Napoleon, Missouri.

Q. And how far down is that?

A. Well, I don't have a corps of Engineers' chart here. I can't give you the exact mileage.

Q. Well, approximately?

A. I would say it would be 15 or 20 miles. As far as the complaint, sir, about the taste of the fish, before I was assigned to this area I worked in the area along the Missouri River in Callaway and in Cole Counties, that is Jefferson City. We received complaints down there continually about the bad taste of the fish as well as in this particular district here.

MR. SAMSON: I see. I believe that is all. Thank you, Mr. Coleman.

CHAIRMAN WILSON: Any other questions?

That is all.

(Witness excused)

RAYMOND BISHOP,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. STEIN:

Q. May we have your name and address, sir?

A. Raymond Bishop, 1025 Taylor Drive, Boonville, Missouri.

Q. What is your position, Mr. Bishop?

A. Superintendent of the purification plant at Boonville.

Q. Is that the water purification plant?

A. Yes.

Q. That supplies the public water supply for Boonville, Missouri?

A. Yes, sir.

Q. Would you face the Board, sir. How many years of service have you had in that water plant?

A. Twenty-two years.

Q. In those years would you say that the Missouri River--which I assume you use as a source of raw water supply, is that correct?

A. Yes, sir, that is right.

Q. Would you say that that river was getting better or worse as a source of public water supply?

A. Very definitely worse.

Q. What are the indications that it is getting worse?

A. Well, from our records we have compiled over the past 20 years chlorine demand wise the addition of chlorine which is required to purify the water to make it potable and safe to drink,and also the taste and odor problem that we have experienced over the past 22 years.

Q. Have you required increased chemicals and coagulation treatment?

A. Yes, sir, I have. Just for a comparison, in 1939 our chlorine demand then--now, this is to maintain on top of our filters, rapid sand filters, about a two part per million residual chlorine. This is rather high, but we do that for our protection for a point of safety. The chlorine demand at that time was approximately 22.4 pounds per million gallons. That was in 1939.

In 1959 the demand increased to 100 pounds per million gallons of chlorine to maintain this two parts per million residual.

Q. Do you recall the odors from the river last winter?

A. Yes. We keep records in our plant by observing the taste and odors. If you would care to have me do so, I have some figures going back to 1956 of the number of hours and the number of days on which we experienced extreme odor conditions.

Q. Yes, if you would, briefly.

A. In the year 1956--and I will also give you river stages since I heard this point mentioned--the river stage in 1956 for the year average was 6.7 feet. The days that we experienced extreme odors was 40 and the hours our river pumps did not pump due to the fact of a highly contaminated polluted water was 50 days--hours. In 1957--

MR. KOENIGSDORF: 50 days or 50 hours?

A. 40 days and 50 hours. In 1957 we had four days in which we experienced the heavy odors and 15 hours in which the pumps did not work.

In 1958 the river stage was 9.9. We had 45 days of a high odor and 47 hours in which the pumps did not work.

In 1959 the river stage 9.7, 29 days of high odor, 37 hours that the pump did not work.

In the first five months of 1960 the average river stage 11.1, the number of days in which we have detected a high odor 50, the number of hours the pumps have been off 10.

MR. POOLE: I didn't get the river stage for 1957. Did you mention it?

A. 1957, 8.0. Now, I would like to clarify this. There is many times when this river carries an odor that we go ahead and continue to pump, and I would like to clarify this a little further by stating or saying that we at Boonville are very fortunate in having two large presedimentation basins, which allows us to presettle the river water approximately 76 hours. When the river gets so bad--and I would like to say this, that there are times when you can step out of your door anywhere in Boonville and it smells almost like walking up to an open septic tank. You can smell it all over town. That being true, and we have the 76 hours of settling time, our water, which has been pumped previous to this odor, will discontinue to pump and let the worst part of the odor go by. And the duration of that has at times been as high as 24 hours that we were unable to pump and has been perhaps two hours. It seems like it comes down in more or less slugs when it comes down.

Q. (By Mr. Stein) Mr. Bishop, I guess you are aware of your bacterial counts there. Do you think they are high?

A. Well, yes, we have noticed an increase in our--however, we don't go into that too much in detail, but our fermentation tubes there are in greater numbers than they were previously.

Q. I noted previous testimony indicated you may have used an average of over 100 pounds of chlorine to million gallons of water?

A. That is right.

Q. How high have you gone up sometimes? Have you ever gone up over 160 pounds?

A. Let's see. The highest that I could recall was 148 pounds per million gallons.

Q. Do you believe that the present condition of the river presents a potential health hazard down there?

A. I certainly do.

Q. Do you believe that if the river were cleaned up you would have a greater margin of safety in processing the water?

A. Yes, I do. And I would like to say this, we are depending now upon mechanical equipment and personnel to make sure that--or at least try to be sure that we are furnishing our customers with potable water. And I look upon my man in charge of our filtration plant as being more important to our community than any doctor might be due to the fact if this chlorinator failed to work or if for some mechanical reason this operator wouldn't be careful with his operation, in his handling his plant, that the possibilities there with the highly contaminated water would be much greater than it would be if it was not so highly contaminated.

MR. STEIN: We have no further questions.

CHAIRMAN WILSON: Any cross-examination?

Members?

That is all.

MR. JOHNSON: Yes, I believe I have.

CHAIRMAN WILSON: Mr. Johnson.

Q. (By Mr. Johnson) Mr. Bishop, did you say 50 days since the first of 1960?

A. Sir, the first five months of 1960.

Q. Yes.

A. Yes, sir, 50.

Q. That is higher than any other years, I take it?

A. So far that is, yes, five days. Back in 1958 we had 45 days for the entire twelve months.

Q. But this is 50 days so far?

A. And this is 50 days so far, the first five months of 1960.

MR. JOHNSON: Thank you. That is all.

CHAIRMAN WILSON: That is all.

(Witness excused)

GEORGE HACKLEY, JR.,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. STEIN:

Q. May we have your name and address, sir?

A. I am George Hackley, Jr. I live at 620 Howard Street, at Glasgow, Missouri.

Q. What is your position, Mr. Hackley?

A. I am serving as Superintendent of City Services, which includes the supervision and management of the water department.

Q. Does that handle the public water supply of Glasgow, Missouri?

A. That is right.

Q. Where do you get your source of raw water supply?

A. We take it directly from the Missouri River.

Q. What problems do you encounter, if any, from the condition of the water?

A. Periodically every winter without exception for the last few years we have been having serious taste and odor problems. As I say, they are very regular. We can expect them every winter, the way it seems. The odors are detected all over town. We are not able to shut down, we always operate through it, for the lack of--well, we are afraid to shut down for the lack of excess water. However, we have had no consumer complaints, but it is very easily detected in the finished water by someone that is familiar and is looking for it.

Q. Did you ever experience any foaming in your treatment plant showing up in your primary mixing basin?

A. Yes, sir, more so in the last year or two. I haven't noticed it--I didn't notice it before the last two years.

Q. What is that, sort of a foam on top of the water?

A. Yes, it is a foam that collects in the corner of the basin. It sometimes gets six or eight inches high and it usually forms where there are whirlpools and it is very noticeable.

Q. Do you think you would be able to provide the people of Glasgow with their finished water with a greater margin of safety if your raw water were of better quality?

A. Absolutely.

MR. STEIN: No further questions.

CHAIRMAN WILSON: Any cross-examination?

Q. (By Mr. Samson) I just want to find out, how far is Glasgow down from Kansas City, Missouri?

A. Frankly, I don't know. I believe it is--

Q. Well, approximately?

A. It is 100 automobile miles or a little more. It is probably close to 140 river miles, I imagine.

Q. And Boonville, how far downstream is that from Glasgow?

A. Approximately 25 miles.

MR. SAMSON: I see. Thank you very much.

CHAIRMAN WILSON: Any other questions?

MR. POOLE: I was just about to ask, Mr. Chairman, because the same thing is troubling Mr. Samson as me, why don't we put the mpa, I don't know which number it is, of the Missouri River up on one of these easels and then we can tell locations generally we are talking about.

Q. (By Mr. Samson) Boonville is how far from Glasgow?

A. Approximately 25 or 28 miles.

Q. On foot or downstream?

A. Yes, from--

MR. STEIN: May I go off the record for a moment? Without objection I think we can read the official figures, if you want them I will put them in the record, for the river miles of all the cities down river if this would be helpful.

MR. SAMSON: I think the map clears it up, Mr. Stein.

MR. STEIN: Okay.

MR. SAMSON: It does for my purposes.

CHAIRMAN WILSON: That is Exhibit 54. It shows the relative locations, but not the mileage.

MR. EDELMAN: It does show the river miles.

MR. HOPKINS: The mileage at Kansas City is 378, at Lexington 320.

CHAIRMAN WILSON: Where is that from?

MR. HOPKINS: That is 58 miles below Kansas City.

CHAIRMAN WILSON: That mileage above the mouth of the Missouri River?

MR. HOPKINS: Above the mouth of the river.

CHAIRMAN WILSON: All right.

MR. HOPKINS: Subtracting them gives the difference below Kansas City.

CHAIRMAN WILSON: Oh, then those mileage figures are on that Exhibit 54?

MR. HOPKINS: Yes. Lexington is 58 miles downstream from Kansas City, Glasgow is 159 river miles, Boonville is 189 river miles, Jefferson City 242 river miles.

MR. SAMSON: Thank you Mr. Hopkins.

CHAIRMAN WILSON: That is all.

(Witness excused)

FRANCIS M. MIDDLETON,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. EDELMAN:

Q. Will you please give your full name, Mr. Middleton?

A. Francis M. Middleton.

Q. By whom are you employed?

A. U. S. Public Health Service, Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.

Q. What are the functions of the position you hold?

A. I am a chemist in charge of organic contaminant studies in the chemistry section of the water pollution division of the Robert A. Taft Center.

Q. Will you tell us briefly what kind of work that involves?

A. We have been for the past ten years looking for organic contaminants that affect water quality, particularly taste and odor, to find out what levels of these materials are present, what the damage is, and what to do about them.

Q. What professional training in the field of sanitary engineering have you had, Mr. Middleton, or engineering?

A. I am a graduate chemist with a Bachelor of Science Degree; I have a Master's Degree in Public Health.

Q. Mr. Middleton, based on your experience and education, when a river is polluted by untreated sanitary, industrial and other wastes, what would you consider the most significant source of taste and odor problems confronting water plant operators who use that water as a source of supply?

A. Most taste and odors stem from organic contaminants that get into streams. These organics may come from industry, from sewage or from other sources.

Q. Do these organic contaminants have any special identifying characteristics?

A. One of their characteristics that is useful in trying to seek them out is that they are soluble in organic solvents; chloroform has been found to be a particularly good solvent for recovering these materials from water or from carbon filters.

Q. Is this material which is so soluble in chloroform in your opinion a source of odor in water?

A. Yes.

Q. How do you know that?

A. We have taken odorous water and treated it by passing it through an activated carbon filter which has the adsorptive capacity to remove these materials. The materials can then be removed from the carbon by extracting the materials from the carbon and these in turn have odor. If we put these back into water, the water has then the reconstituted odor that was in the river at least to a fair degree.

Q. How about the alcohol soluble components?

A. The alcohol soluble components are somewhat less odorous, but they still represent organic contaminants and they represent a somewhat different group, being the materials that are more water soluble than chloroform soluble and which include such materials as part of the synthetic detergents and highly oxidized materials that are more aged in pollution than these extracted by the chloroform.

Q. Based on your experience, do these odor-causing organics tend to go through the kind of water treatment that has been described here as available on the Missouri River?

A. Yes, they tend to survive ordinary water treatment, usually in amounts that are very close to those that are found in the raw water.

Q. Mr. Middleton, did you participate in and direct a study of the chloroform extractable and alcohol extractable materials in the Missouri River in December of '59?

A. Yes, I did.

Q. Can you tell us what the elements of this study were with respect to the taste and odor potential of the river?

A. First we actually ran odor tests directly on the river without the use of chloroform or alcohol extractables to get the human response to the actual odor levels of the river.

Q. Do you have a chart which visually represents this threshold odor data?

A. Yes, I do.

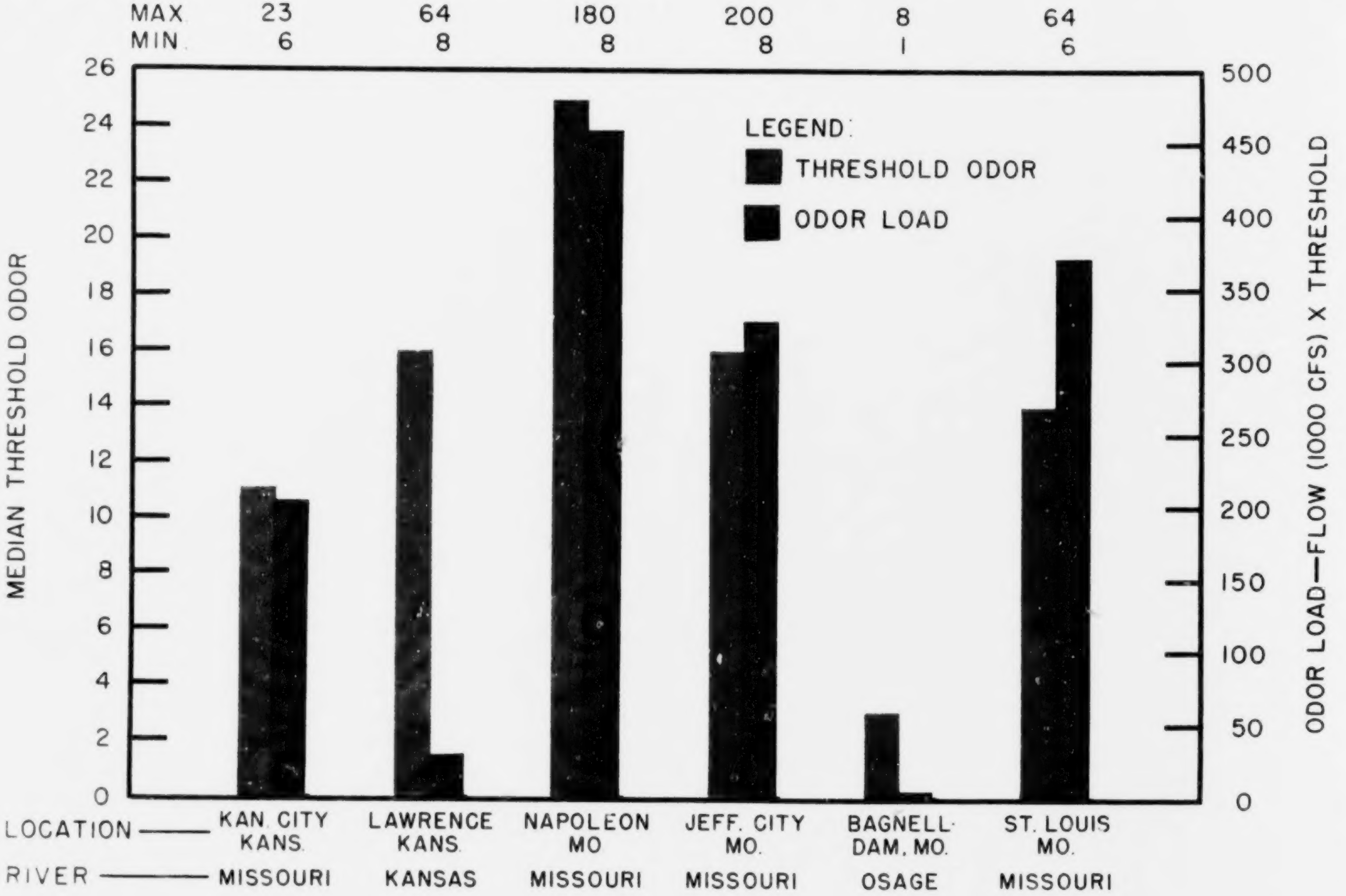
Q. May I have it?

MR. EDELMAN: I ask that this chart bearing the legend "Daily Samples December 7 to 20, 1959, Threshold Odor Data" be marked as Government Exhibit 62 for identification.

(Government's Exhibit No. 62
marked for identification.)

Q. (By Mr. Edelman) Mr. Middleton, would you generally describe what that chart shows without going into the details of your markings?

DAILY SAMPLES - DEC. 7-20, 1959
THRESHOLD ODOR DATA — ODOR LOAD
MISSOURI RIVER — RAW WATER



286-b

A. The threshold odor of a water is a measure of the intensity of the odor sensation--

Q. May I interrupt you? I just want you to describe the scale the chart is in and then what it represents before you go into that.

A. All right. The vertical lines represent the median threshold odor on this side (indicating). This goes from zero to 26 on the chart. The vertical scale on the right represents the odor load which takes into account the flow in addition to the odor. This is the median threshold odor or the middle number of several observations. To arrive at this figure we had men from the sanitary engineering center stationed at Kansas City and at St. Louis who gathered together a panel of from three to five observers and they sampled the water each day for a period of two weeks.

Q. And these markings on the chart represent the results of these panel tests?

A. These are the results of the panel observations on the level of the odor.

MR. EDELMAN: I offer this chart in evidence as Government Exhibit No. 62.

CHAIRMAN WILSON: Any objection?

Received.

(Government's Exhibit No. 62 received in evidence.)

Q. (By Mr. Edelman) Before we go into the chart, Mr. Middleton, can you tell us a little more in detail what a threshold odor panel is and how it operates?

A. The procedure for determining odor in water is to take the water and dilute it with water which has no odor, which you have to obtain by passing it through a specially prepared carbon filter. The actual number of times that you dilute the odorous water becomes the threshold number. In other words, if a water has a threshold of 10, it means that to one quart of that water you added nine quarts of odor-free water so that you had a one to ten dilution.

Q. Is this an accepted method in the water treatment field for determining odor of water?

A. Yes, this is a standard method used in the water treatment field.

Q. Will you tell us what the tests that were run on the raw water at these various places showed?

A. To make the data more useful we used more than one observer and, as I said, these results are the result of several people running the same test and then the figures taken are the median figures. At Kansas City, Kansas, water plant intake the median threshold was about 11. The threshold times the flow is about 250 here, roughly.

At Lawrence, Kansas, the odor intensity of the water is about 15, but the flow in the Kansas River at this particular time is only about one-tenth of that of the Missouri River, so the actual odor load is the small number here, about 2.

Q. Mr. Middleton, about geographically how far is Lawrence, Kansas from Kansas City, Kansas?

A. I believe it is about 60 miles up the Kansas River.

Q. Will you continue?

A. The odor then that you might expect to find below Kansas City, if there were no pollution or if the river was in the condition that it is at Lawrence, Kansas, would be the small blue line added to this blue line, that would be the total expected amount of odor. Measuring the odor at Napoleon we found both the threshold to be greatly increased and the total odor load to be quite high.

Going on down the river, at Jefferson City the odor load is still much higher than it is at Kansas City. We examined the Osage River at Bagnell Dam and the flow there again is about one-tenth or less than in the Missouri River and the odor load is very insignificant. We can't account for any odor addition to the Missouri River by the Osage River. The threshold is low, the odor load is extremely low.

At St. Louis, Missouri, the odor load is higher than it is at Jefferson City, even, and the threshold is about the same.

Q. Just as a matter of information, Mr. Middleton, did you take any data below St. Louis on the threshold odor, with the threshold odor panel?

A. St. Louis on the Missouri River?

Q. Yes.

A. No, not below. This was at Howard Bend water plant.

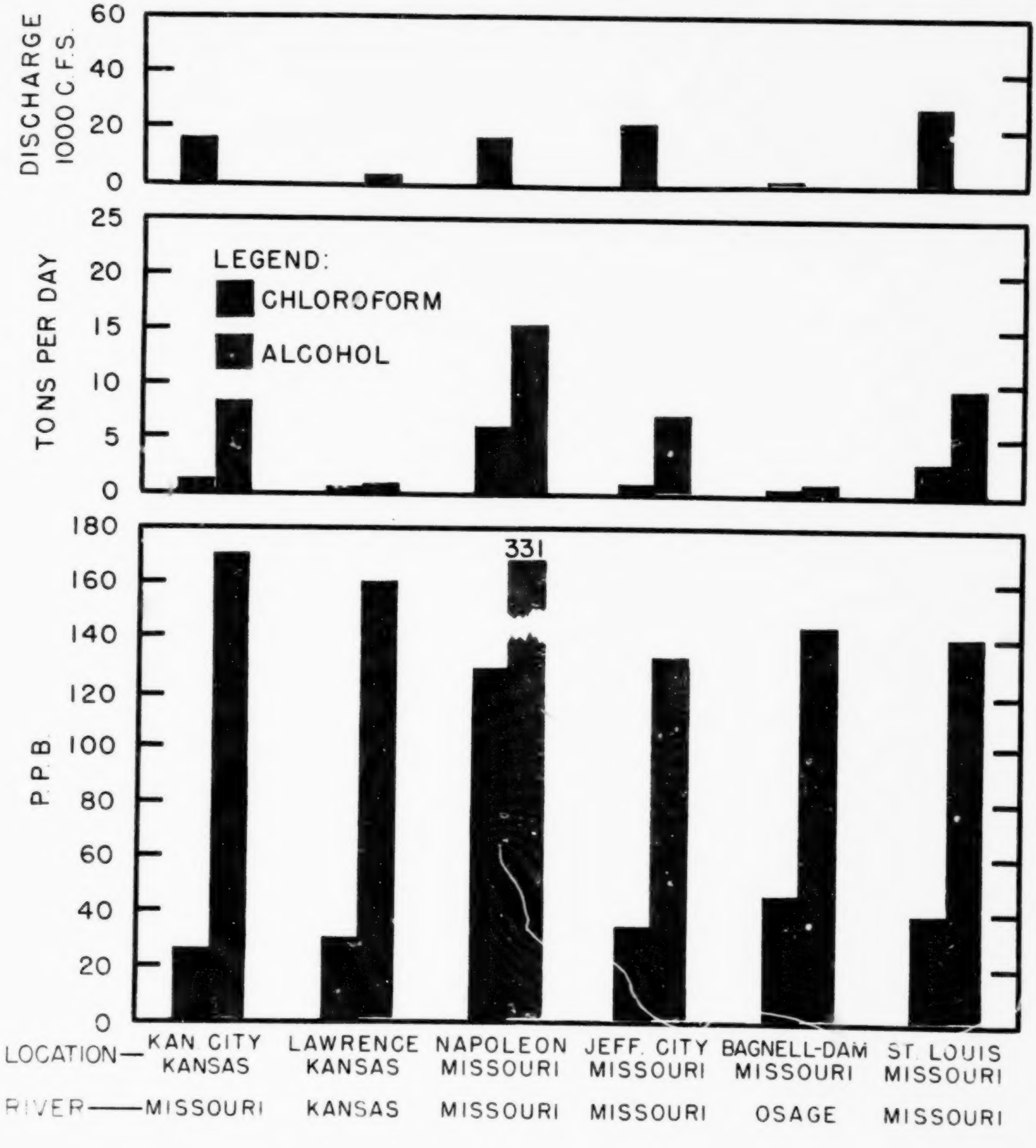
Q. To what do you attribute or do you have an opinion as to the reason for the rise of threshold odor dilutions required at Napoleon, Missouri?

A. There was no rainfall, there were no extenuating circumstances that we could locate to cause this change, and I would attribute it to the organic pollution from the Kansas City area.

Q. Does the Jefferson City result show any increase over what you would have at Kansas City, Kansas?

A. The odor load at Jefferson City is still higher than that we experienced at Kansas City. It is reduced some from that experienced at Napoleon, but is still higher than that at Kansas City.

CARBON FILTER DATA–MISSOURI RIVER, DECEMBER, 1959



Q. In your opinion, would you say that there is a contribution from the Kansas Cities area to the odor potential of the river at Jefferson City, Missouri?

A. Yes, I would say that was indicated.

Q. Does that contribution extend to St. Louis, Missouri?

A. I would say that this was indicated, since we have not been able to find substantial additional sources of pollution between these cities.

Q. Now, as I recall, these are based on the raw water taken from the river?

A. These are raw river water samples.

Q. Did you determine the concentration of organic contaminants that were identifiable through extraction by either chloroform or alcohol in the Missouri River at these points along the river?

A. Yes, we did that.

Q. Do you have a chart which presents that evidence in visual form?

A. Yes, I do.

MR. EDELMAN: Chart bearing the legend "Carbon Filter Data - Missouri River, December 1959" marked Government Exhibit 63 for identification.

(Government's Exhibit No. 63 marked for identification.)

Q. (By Mr. Edelman) Will you just describe the ordinates on this chart, Mr. Middleton, for identification?

A. There are three portions to this chart. The lower one expresses the actual concentrations of chloroform, which is in green, the alcohol in the brown, expresses the concentrations that were recovered from the raw water by the carbon filter procedure. The middle chart expresses the tons per day of these components, which, of course, takes into account the river flows at these particular sampling times. The top chart is the discharge in thousand cubic feet per second so that you can follow the river flow.

MR. EDELMAN: Offer this in evidence as Government Exhibit No. 63.

CHAIRMAN WILSON: Any objection?

Received.

(Government's Exhibit No. 63 received in evidence.)

Q. (By Mr. Edelman) Mr. Middleton, will you tell us what your analysis and laboratory studies disclosed with respect to taste and odor-causing organics at these points?

A. I believe the best chart here to follow is the actual load on the river in terms of tons per day, which is derived from the concentrations and the flow. At the Kansas City, Kansas, water plant we found this level of about two and a half to--about two, two and a half tons per day of chloroform extractables and about six or seven tons a day of alcohol extractables.

Sampling the Kansas River at Lawrence, Kansas, while the total level here that was measured was fairly comparable to that at Kansas City, Kansas, the flow being only one-tenth as great the total load contributed is very minor, less than a ton per day there.

At Napoleon, Missouri, the recovery--this is a broken line to show that it went off of the chart here--of 331 parts on the alcohol extractables and about 120 parts on the chloroform extractables shows a very substantial increase in the tons per day of organic contaminants at Napoleon compared to those found at Kansas City.

At Jefferson City, Missouri, there has been a drop-off, the Osage shows no large contribution here because there is very little flow, and the level at St. Louis, Missouri, Howard Bend Plant is slightly higher than at Jefferson City and roughly at the level that we had at Kansas City, Kansas. This was made in December from about the 6th to the 20th at a period of no rainfall.

Q. Do you have an opinion, Mr. Middleton, as to the extent to which discharges from the Kansas Cities Metropolitan Area contribute to the loadings at Napoleon, Jefferson City, and St. Louis, Missouri, as to what you have testified?

A. The discharge of any organic wastes will cause the introduction of residues which are not removed by either natural purification or by water treatment. If the river were long enough they might finally be removed if there were no new pollution introduced. At Napoleon the evidence is that there is a very substantial rise above concentration in loading and we can only ascribe that to the pollution from the Kansas City areas. This has lessened somewhat at St. Louis--or at Jefferson City, but had this new pollution not been introduced we would have expected a diminishing of this amount depending upon various conditions, such as the time of the year, temperature, biological action, and so on.

At St. Louis, Missouri, the level of these materials has held up and, in fact, there is a slight increase, but this is almost within the level of analysis here, but there is a slight increase shown on this data which was collected.

Q. Are you in a position to express an opinion as to whether or not this level of concentration of chloroform soluble materials in the Missouri River at the St. Louis Water Plant extends beyond the plant to the mouth of the Mississippi and Missouri confluence?

A. Beyond the mouth?

MR. KOENIGSDORF: Excuse me, please. I would like to have that question read back.

Q. (By Mr. Edelman) Are you in a position to express an opinion as to whether the level of concentration of chloroform soluble materials that you have indicated as existing at the water plant at St. Louis extends substantially unchanged to the mouth of the Mississippi River, that is beyond the water plant?

MR. KOENIGSDORF: Thank you.

A. We did not make any tests at the mouth of the Missouri River, but I believe the distance here is about 30 miles and our experience is that there would be little, if any, diminution in concentration in that length of river, particularly in the wintertime.

Q. (By Mr. Edelman) Did you do any other special studies on any other portions of the Missouri River or the Kansas River or waters in that area?

A. We did do a few special studies on the Kansas River water above and below the metropolitan area and on the Missouri River above and below the confluence of the Kansas and Missouri Rivers.

Q. Were you able to complete any of these studies as to--

A. I have some figures that we have compiled from some of this work.

Q. Can you tell us whether included in these figures is any information as to the rate of these organics that are discharged, say, at Turkey Creek Sewer?

A. We have three results of direct extraction of chloroform of Turkey Creek samples.

Q. What do these results show?

MR. SAMSON: Is that at Turkey Creek?

A. Yes. These were composite samples taken over a 24-hour period in the first case, in the second case about a 16-hour period. The first sample was taken during the December survey and the chloroform soluble organic loading as taken by chloroform extracts directly of this sample yielded a 6.8 ton per day figure of organics.

On May 31st we did a comparable study and we recovered a very large amount of oily substances and measured at this rate at 86 tons per day being discharged.

On June 1st another sample was taken in the same manner and yielded a 14 ton per day level of extraction.

Q. (By Mr. Edelman) At what other points on the river did you perform this analysis?

A. We took a sample at Bonner Springs on the Kansas River, which is below Lawrence but above all of the metropolitan area. We took a sample at the mouth of the Kansas River at the third bridge back from the mouth. We took a sample at Kansas City, Kansas, and at Napoleon, Missouri.

Q. Would you tell us what these studies disclosed?

A. The samples were taken on the 29th of April 1960. In the case of Napoleon it was on the 30th of April. At Bonner Springs we got a river loading of 11 tons per 24 hours. At the mouth of the Kansas River we got 122 tons for 24 hours. At Kansas City, Kansas, we got 58.7 tons.

Q. Kansas City, Kansas, is that above the Kansas River?

A. That is above the Kansas River.

Q. What points?

A. At the water plant intake. At Napoleon, Missouri--

MR. SAMSON: Pardon me. Is that on the Missouri River?

A. Yes.

MR. EDELMAN: At the water plant intake of Kansas City, Kansas, on the Missouri River.

Q. (By Mr. Edelman) That is 58.6, did you say?

A. 58.7 tons. At Napoleon we got a level of 292 tons of gross extractable materials. The river had risen over that one-day's period. There is some flush-out there, but the flow has gone up from 41,000 at Kansas City to 62,000 at Napoleon, with the Kansas River contributing 11,000 cfs.

MR. SAMSON: Mr. Middleton, you got 58 tons--I am sorry to interpose this question at this point, but you got 58 tons at the water plant on the Missouri River above Kansas City, Kansas?

A. Yes.

MR. SAMSON: What did you get at the confluence of the Kansas River--

A. 122 tons.

MR. SAMSON: --and the Missouri River? 122 tons?

A. 122.

Q. (By Mr. Edelman) Do you have any samples of the materials that you described as having been extracted from the Missouri River water?

A. Yes, I have.

CHAIRMAN WILSON: Mr. Middleton, before you go on and testify to that, in connection with the last question asked you by Mr. Samson, do we understand that the samples shown on those two charts, Exhibits 62 and 63, indicated by the graph there relating to Kansas City, Kansas, were taken at the Kansas City Water Plant?

A. Yes. These were carbon filter samples. The other samples were not carbon filter samples. They were taken directly on the water, which included all of the silt, whatever was suspended in the water, whereas the carbon filter samples have received prefiltration through sand.

CHAIRMAN WILSON: What I want to make clear is that the samples for the data shown on those two charts relating to Kansas City, Kansas, were taken above the point--

A. Yes.

CHAIRMAN WILSON: --where any of the pollution from the metropolitan area enters the stream?

A. They were taken at the Kansas City, Kansas, water plant, which to my understanding is above any pollution of the metropolitan area.

CHAIRMAN WILSON: Very well. You may proceed.

Q. (By Mr. Edelman) And that applies to the threshold data?

A. The same applies to the threshold odor data.

Q. Do you have any samples of the material that was extracted from the Missouri River water?

A. I have some samples from Kansas City, Kansas, and from Napoleon, Missouri, which I have in the box here.

Q. Can you identify some of them that you consider to be characteristic of your samples?

A. I think so. The type of sample that we collect is something of this order. The one from Kansas City, Kansas, is in this vial and a little bit of it has been removed for test. This is the sample--there was actually here before 0.348 grams.

This is a comparable sample taken at Napoleon, and it has one gram in it, roughly three times more material than we have here at Kansas City. You can see that this one is an oily solution, whereas what is left here is a waxy solution. If you would like to detect the odor on these, I will be glad to pass them around.

Q. Would you describe the odor? Would you smell it and then describe the odor for the Board, Mr. Middleton?

A. It would probably be better if they smell it themselves.

Q. Suppose you start.

A. To me, and people vary a great deal as to their response to odor descriptions, this one has a stale and musty odor. This one from the Napoleon area smells quite a bit like the bottom of a crank case and is also mixed with a musty, stale type of odor. It is a mixed odor.

Q. Will you pass those so that counsel and--

MR. SAMSON: May we suggest that counsel inspect those before they come over here to the Commission and see what happens?

CHAIRMAN WILSON: Are these to be introduced as exhibits?

MR. EDELMAN: No, Mr. Wilson, we do not propose to introduce these as exhibits because they would tend to deteriorate with age unless properly refrigerated and stored. I think the witness's description of them is enough for the record. We have no objection to introducing them if the Chair feels it will help the Board in its deliberations and perhaps make a better record.

CHAIRMAN WILSON: You may proceed and have them handled as you wish.

MR. EDELMAN: May I offer these to counsel and indicate my intention to have these introduced in evidence as Government Exhibit 64, the vial from Kansas City, Kansas, and No. 65, the vial representing the extract at Napoleon. May I have those, Mr. Middleton?

CHAIRMAN WILSON: Exhibit 64 is the Kansas City, Kansas, water plant and 65 is the Napoleon water plant.

(Government's Exhibits Nos. 64 and
65 marked for identification.)

A. This was not a water plant at Napoleon. These were collected by the U. S. Engineers at their engineering yard, but there is not a potable water supply at Napoleon. The nearest supply is Lexington, a few miles downstream.

MR. POOLE: There is carbon filter, though, at Napoleon also?

A. Yes.

CHAIRMAN WILSON: Then are you offering these in evidence?

MR. EDELMAN: I am.

CHAIRMAN WILSON: Subject to the explanation you made that they might not be suitable for permanent preservation as exhibits because they would lose their odor characteristics if kept very long.

MR. EDELMAN: They may lose some characteristics.

CHAIRMAN WILSON: Any objection?

They will be received with the explanation stated.

(Government's Exhibits Nos. 64 and 65 received in evidence.)

Q. (By Mr. Edelman) Mr. Middleton, Napoleon is downstream from Lexington. It is nearer Kansas City than Lexington is.

Q. Oh, Napoleon is between Kansas City and Lexington?

A. Yes, sir.

Q. On the basis of the study that you made, do you have any opinion as to the concentration of these organics that you would expect to find at the Lexington water plant intake?

A. I shouldn't expect them to be changed very much at all. The distance is short.

Q. You would expect it to be at about the same level as indicated for Napoleon?

A. Yes.

MR. EDELMAN: We have no further direct, Mr. Chairman.

CHAIRMAN WILSON: Cross-examination, counsel?

MR. KOENIGSDORF: If you please.

CROSS-EXAMINATION

BY MR. KOENIGSDORF:

Q. Mr. Middleton, I wish you would clarify a little further this direct extraction at Turkey Creek and the carbon filter extraction which is made at the other points that you are speaking of.

A. In the case of the direct extraction, a five-gallon sample is collected over a period of 24 hours in one case, in the other case it was 16-hour samples taken hourly, in the case of Turkey Creek it was from the mouth of the creek where the two barrels of the sewer come together. These were taken by samplers from the Public Health Service at Cincinnnati and these samples are then extracted directly with chloroform. Chloroform is poured into the samples, the samples are thoroughly shaken, the organic components of interest are taken up in the chloroform, which is then reduced by evaporation and the contaminants recovered are weighed and the total tonnage is figured then from the flow estimated for Turkey Creek.

In the case of the carbon filter samples, any materials that would be floating adsorbed on silt and any filterable materials are removed before the water goes through the carbon filter, so that essentially we are measuring the materials that are in solution and not in suspension or in solid form.

Q. Some of the material, even on your solution, might remain on the carbon, might it not?

A. The carbon does not remove all of the materials nor do we remove all of the materials from the carbon.

Q. So when we are speaking about direct extraction we are speaking about a higher percentage of removal from the water than we are through the carbon filtration system, are we not?

A. Yes. The gross materials would be measured by that technique.

Q. So comparing these figures on chloroform extraction or solution would be like comparing apples and oranges to say that the tests you ran on the Kaw River were similar to the tests you ran on the Missouri River, is that not correct?

A. The two are not directly comparable, but in both cases the pollution is there.

Q. I understand that. But you are talking about percentage and pounds of this and pounds of that.

A. That is right.

Q. And they are not comparable, are they? You use different methods.

A. You shouldn't compare directly the carbon filter with the direct extraction, that is right.

Q. That is the point I am making.

A. That is right.

Q. Now, am I to understand that the way you get this threshold test is by having five people sit around and smell until the smell is gone? Is that the idea?

A. No, sir, I should clarify that up perhaps, too. You start with the raw river sample and you have this in a flask. And you have nother larger flask of special odor-free water which you have prepared by passing tap water, usually, through activated carbon, which does remove the odorous components. This is your control to judge difference by. You then dilute the river water by a series of dilutions. You put half river water and half odor-free water, then you take half of that dilution and make another dilution and you take half of that and you continue until you may have eight flasks set up, the last of which will have no odor and the end one will have the strong odor. Then the individual panel member who does not know the order of these, and we usually insert blanks into the series so that he won't miss or guess, judges these flasks and he picks out the one where he first detected the odor. The person who made up the series of dilutions knows how many times this flask has been diluted. If he diluted it ten times, then the threshold odor is 10; if he diluted it fifty times, then the threshold odor is 50.

MR. KOENIGSDORF: You handed us these little vials. Were they marked Exhibits 64 and 65?

MR. EDELMAN: Yes, they were.

Q. (By Mr. Koenigsdorf) You made a comment which I though was apropos, that people's sense of smell varies greatly. This is all subjective, this threshold test, is it not?

A. That is true, it is a subjective test.

Q. And there is a great variation in people's sense of smell?

A. Yes, people vary.

Q. Is there any more accurate way of testing odors than by this threshold test? Is there a mechanical test?

A. No, there is no instrument or mechanical means of running this test.

Q. I have been watching television too much. You put the onion on one side and something on the other side and the smell all goes zero. Have you seen that on television?

A. Yes, I have seen that.

Q. That is not true, you can't do that?

A. No, you can't do it on water. Maybe you can on onion.

Q. Now, sir, on the question of some of these odors and their causes I will ask you a couple of academic questions. Do algae in water cause odors?

A. Odors have been associated with algae, yes.

Q. And the second question I will ask you, sir, is if silt in water has a tendency to absorb certain odor-producing bodies?

A. There would be some tendency for this to take place.

Q. Are there any airborne diseases off of water that you know of, off of this type of water? In other words, when we get this smell from the air blowing across the water, are there any airborne diseases that you know of from this type of water?

A. No disease as such.

Q. Aesthetically it is offensive?

A. It is offensive.

Q. But as far as any real illness or disease, there is none that you know of from smelling this water?

A. Odor interferes with the well being of people, objectionable odor.

Q. I understand your point. But my question is, sir, if you know of any illness or disease that arises from inhaling these ordors from the water?

A. No disease. You might be nauseated.

MR. KOENIGSDORF: No further questions.

CHAIRMAN WILSON: Any other questions?

That is all.

MR. EDELMAN: We have some redirect, Mr. Chairman.

CHAIRMAN WILSON: Oh.

REDIRECT EXAMINATION

BY MR. EDELMAN:

Q. Mr. Middleton, would it be fair to say that the direct extraction method of taking chloroform solubles out of water actually measures what is present at that point before it goes into solution or suspension or anything else? It measures what is actually present, does it not?

A. That is essentially correct.

Q. Very well. As I recall your testimony, you did say that you had performed direct extraction procedures not only on Turkey Creek Sewer but on the Missouri River, did you not?

A. I mentioned those at Kansas City and Napoleon.

Q. As I recall, the last set of figures you gave us about what you found at Kansas City and the other points were direct extraction tests from the Missouri River?

A. Yes.

Q. When you get a threshold odor panel do you just take the first five available people you meet or is there some process of selection, Mr. Middleton?

A. The approved procedure is to try to select someone, first of all, who has odor sensitivity without being super-sensitive. You do not need any special technical training to be able to observe odors. Almost any individual can do it. There are a few things that any individual needs to be trained in, in how to handle the glassware, washing his hands, and so on. They are very common sense procedures.

Q. And in selecting the panels for the tests as to which you have testified, you did select the members of the panel in accordance with these criteria of qualification?

A. Yes, the men were selected in accordance with proper procedures.

Q. Do you consider this to be a scientifically valid test for determining odor in raw water?

A. Yes, I do.

MR. EDELMAN: That is all.

CHAIRMAN WILSON: Any further questions?

Members of the Board?

That is all.

(Witness excused)

JOE K. NEEL,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. STEIN:

Q. May we have your name and address?

A. Joe K. Neel, Kansas City, Missouri.

Q. What is your position, Dr. Neel?

A. I am Regional Biologist, Water Supply and Pollution Control, U. S. Public Health Service, Region VI, Kansas City, Missouri.

Q. May we have your degrees and specialized training?

A. I hold a degree of Bachelor of Science in Zoology, Master of Science in Zoology, Doctor of Philosophy in Zoology with specialty of limnology.

Q. Zoology, I take it, deals with animals, doesn't it?

A. Yes.

Q. And organs of animals?

A. Yes.

Q. In the course of your duties did you ever get on the Kansas and Missouri Rivers in this area?

A. Numerous times, yes.

Q. Did you in the course of these duties ever put a net in the river to see what was there?

A. I have placed nets in rivers and in the mouths of sewers.

Q. Can you describe some of those activities in this area?

A. Well, on May 31, 1960, we stretched some nets across some sewers that empty into the Kansas River and into the Missouri River.

Q. Would you care to go to Government Exhibit No. 18 and show where these nets are, if they are on that exhibit?

A. One was at the Santa Fe Street Sewer, which is designated as C-5 in the aerial photograph. The other was at a sewer that drains into the Kansas River, the one designated AM-18 on this map.

Q. Do you have any material you collected?

A. I have. May I describe how we got it?

Q. Yes.

A. We stretched a net across these sewers and left it there for one minute.

Q. One minute?

A. One minute.

Q. And you did it both on the same day?

A. We did it on the same day, one of them at 10:15 a.m., the other one at 11:20 a.m.

Q. Let's take one at a time, that upper one. Would you designate that by number on Government Exhibit 18?

A. No. C-5?

Q. Yes.

A. This is it.

Q. You are holding a jar now with some material in it and some liquid in it, aren't you, Dr. Neel?

A. That is right.

Q. Was this all that appeared in the net in one minute?

A. That was caught in one minute in the net.

Q. What would you say is the material in this jar--

CHAIRMAN WILSON: Just a minute. Are you going to offer that in evidence?

MR. STEIN: Yes.

CHAIRMAN WILSON: Which exhibit number is that?

MR. EDELMAN: That will be No. 66, Mr. Chairman.

(Government's Exhibit No. 66
marked for identification.)

MR. STEIN: No. 66 is an exhibit entitled "Santa Fe Sewer to Missouri River May 31, 1960, at 12:15 a.m., Held One Minute."

A. I think that is 10:15.

Q. (By Mr. Stein) What? 10:15?

A. 10:15.

Q. 10:15, I am sorry, a.m., held one minute. I assume the net was held from 10:15 to 10:16?

A. Well, that is right.

MR. STEIN: I offer this in evidence as Government Exhibit No. 66 and I would like to indicate, because of the nature of this exhibit and the subsequent ones offered by Dr. Neel, that this may deteriorate in time if not held under proper conditions.

CHAIRMAN WILSON: Is there any objection?

MR. KOENIGSDORF: Since we have stipulated and agreed a long time ago I wouldn't keep making objections to these things that go into the Missouri from the Missouri side and don't touch Kansas, why, I am going to keep my word. But this is one of those things that is from Missouri and goes down the Missouri and doesn't touch Kansas in any place.

But no objection as long as my objection still stands.

CHAIRMAN WILSON: It will be received subject to those comments.

(Government's Exhibit No. 66
received in evidence.)

Q. (By Mr. Stein) Would you describe the liquid in this?

A. The liquid is a solution of formaldehyde which is used to preserve the organs that were collected on the net.

Q. Would you say that the solid material in this jar are organs?

A. It looks like they are organs, internal organs.

Q. In your opinion what are they internal organs of?

A. It looks like a piece of stomach with attached mesenteries and fat particles.

Q. Of what?

A. Of a cow, a ruminant of some sort.

Q. Would you describe the procedure and the location of the other place you collected material?

A. The other place was the sewer designated AM-18 which empties into the Kansas River at this point (indicating).

MR. SAMSON: What was that, Doctor? What was that sewer name?

A. AM-18.

MR. SAMSON: AM-18?

Q. (By Mr. Stein) Is that in Kansas?

A. It is in Kansas. We visited that sewer at 11:20 a.m., followed the same procedure, and--

Q. Was it the same day?

A. Same day.

Q. What day is it?

A. May 31, 1960.

Q. Do you have what you collected in a net?

A. Part of the things.

Q. Part of it put into a jar?

A. It is in a jar, treated in the same way.

MR. STEIN: This jar is labeled "Swift and Company Sewer to Kansas River May 31, 1960, 11:20 a.m., Net Held One Minute" and I ask that this be identified as Government Exhibit No. 67 for purposes of identification.

(Government's Exhibit No. 67
marked for identification.)

MR. STEIN: And I offer this in evidence as Government Exhibit No. 67.

CHAIRMAN WILSON: At what outlet was that?

A. AM-18.

CHAIRMAN WILSON: AM-18?

A. Yes.

CHAIRMAN WILSON: Any objection?

Q. (By Mr. Stein) This is not the total collection from the net?

A. That is not the total collection.

Q. What is the liquid in this jar?

A. It is a solution of formaldehyde.

Q. Is this a Mason jar?

A. Oh, it is a jar that we use for samples. I don't know, sample jar.

Q. Samples. Would you identify the solid material other than the formaldehyde and the labeling in here?

A. This appears to be a piece of lung with either attached esophagus or a piece of trachea or something of that nature. At least the dark material looks like lung.

MR. STEIN: I would like to offer this.

CHAIRMAN WILSON: I understood there was no objection, so it is received.

(Government's Exhibit No. 67
received in evidence.)

Q. (By Mr. Stein) Would this present a substantial part of your collection there or just a little bit of your collection?

A. It is a small portion. The greatest amount of material we collected was substance known as paunch manure. It is the contents of the ruman or the first stomach of a ruminant that is dumped into the waste from packing houses and is quite characteristic in appearance. It contains numerous fibers which are all very near the same length. We got that out of both sewers in addition to these entrails. The Swift and Company sewer also contained numerous globules of congealed blood.

Q. That was AM-18?

A. AM-18. Both AM-18 and C-5 had the paunch manure.

Q. You don't customarily collect paunch manure in bottles, do you?

A. No, we do not. We get that on the net.

MR. STEIN: We have no further questions.

CHAIRMAN WILSON: Any cross-examination?

CROSS EXAMINATION

BY MR. KOENIGSDORF:

Q. You must have taken a net sampling at the Turkey Creek Sewer, didn't you?

A. We did not on this occasion. The river was up and the discharge from that sewer was just a slight override of back water that had backed up into the sewer. We didn't think it would be diagnostic.

Q. In preparation for this hearing weren't you required to take a sampling of the Turkey Creek Sewer outfall?

A. No, I was not.

Q. You were not? You have taken samplings before?

A. I have sampled in the mouth and below the mouth of the Turkey Creek Sewer, yes.

Q. Have you brought those with you?

A. No, I do not have them with me.

MR. KOENIGSDORF: No further questions.

CHAIRMAN WILSON: Any further questions by members of the Board?

MR. SAMSON: Well, I have.

Q. (By Mr. Samson) What is the result of those samples? I will ask the question.

A. The Turkey Creek--

MR. KOENIGSDORF: I will object to that, not being the best evidence.

CHAIRMAN WILSON: He may answer if he knows.

A. The Turkey Creek discharge contains numerous evidences of human fecal contamination, garbage, cigarette butts, rubber contraceptives and matter of that nature. If you stand there you can see garbage, items of garbage, such as cabbage leaves, grapes, even cranberries and things like that coming out of that sewer. The floating solids, oh, patches up to a foot or more in diameter with the characteristic nauseous smell that those materials have. The dredgings from the bottom there have contained all types of human waste products, including cigarette butts and various and sundry items of food, some of them partly digested.

CHAIRMAN WILSON: Any other questions?

That is all Doctor.

(Witness excused)

RICHARD W. VAUGHT,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR STEIN:

Q. May we have your name and address?

A. Richard W. Vaught, 308 St. Joseph, Columbia, Missouri.

Q. What is your position, Mr. Vaught?

A. I am a water fowl research biologist with the conservation commission.

Q. Conservation commission of?

A. Of Missouri.

Q. Of the State of Missouri?

A. State of Missouri.

Q. Mr. Vaught, in your duties have you had the opportunity to familiarize yourself with the wild fowl population of the Missouri River Valley below the Kansas Cities area?

A. Yes, sir.

Q. I wonder if I could direct your attention to a map behind you, Government Exhibit No. 2, consisting of three charts, which shows the Missouri River from above the Kansas Cities area down to St. Louis. I wonder if, with the aid of that exhibit, you can show us areas in the river where wild fowl are and are not?

A. Point it out?

Q. Yes, go right ahead and describe it. And in addition, when you get to these areas you can tell us how you arrived at your conclusions.

CHAIRMAN WILSON: I suggest that you just move those maps over to the next easel, put the first one on the larger easel, so that we can see them better.

A. Since 1937 we have flown water fowl inventory accounts in order to get thrend data on populations using the river from Jefferson City all the way to the Iowa line. Some years the flights are made weekly, some years made bi-weekly.

Q. (By Mr. Stein) These flights are made by airplane, are they not?

A. These are aerial inventory flights made approximately from 100 to 250 feet above the surface of the river. The area from Jefferson City to Brunswick, this area here (indicating), we have observed pollutants very, very seldom. Once in a while we observe a little pollutant behind pilings or if the river is in a calm condition and no wind blowing it is a little more visible then. But starting at Brunswick it progressively grows worse as you move on towards Kansas City. Water fowl populations have consistently used the river since the beginning of the inventory flights in 1937 from Kansas City all the way down to Jefferson City. Beginning in 1955 or 1954, I should say, we noticed that water fowl populations begin to decline in an area from around Lexington on up to Kansas City. During some days the flights--flights are usually made on Monday mornings--we will find from Jefferson City to Brunswick from, say, 100 to 5,000 mallards. Then as you move on up river it gradually declines until you reach almost Lexington and from Lexington on farther up the river to Kansas City you might as well terminate the flights because there are just not any water fowl using it.

On one occasion, this occurred in 1945, some water fowl were stranded at Sibley, Missouri, because of an oil pollutant covering the surface of the water.

Q. Where is Sibley?

A. Just above--let's see if I can orient myself here--just above Napoleon about--here it is right here (indicating), about eight miles above Napoleon.

Q. Will you continue, sir?

A. Which places it about, oh, I would say around 30 to 35 miles below Kansas City. The flight is usually made up the river until we reach Missouri City. Some days we progress farther up the river, but it was really useless. Most of the time we would hit Missouri City and cut cross country and hit the river again just above Kansas City.

Q. What did you see at Sibley, Missouri, on the occasion that these ducks were stranded?

A. Well, our flights are made from September 1 to January 15. During that period of time you catch the river in a low stage, in late winter, and flowing fairly clear. On days when it is calm without any wind, why, it is very obvious that--on December 20th of this year I saw the worst pollution I have ever seen from Brunswick all the way up to Kansas City.

Q. Were there any ducks there?

A. No ducks visible.

Q. Do you have any opinion as to why there are fewer ducks on the Missouri River between Kansas City and Brunswick than below Brunswick?

A. The only reason that I can give for a lack of ducks in this stretch of river is because of a surface pollutant. They just don't use it. And it is not because there is not water fowl flying over that area, because this is one of the grand passes of water fowl in migration along the edge of Kansas City. Following the river down, they band from the river here on the western edge of the state all the way over to Chillicothe and it is a mass movement right through this area.

Q. In your opinion, sir, if that pollutant were removed, would you expect to find water fowl in the stretch of the river between Kansas City and Brunswick?

A. Just as much so as we would any place else, because as far as the river condition is concerned and the habitat, other than a polluted stream it is as good as it is anywhere.

MR STEIN: No further questions.

CHAIRMAN WILSON: Any cross-examination?

That is all.

Q. (By Mr. Samson) Of course the population and the general human activity in the area would tend to cut down some, wouldn't it, the activity of ducks or the presence of ducks?

A. Usually when water fowl are using the river, activity doesn't affect them too much. When boats are using--very much traffic is using the river, which usually occurs around some of the other towns, the birds usually circle the vehicle or the boat that is causing the commotion and move above it and float down again.

MR. SAMSON: I see. Thank you.

CHAIRMAN WILSON: That is all.

(Witness excused)

HERBERT J. FISHER,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. STEIN:

Q. Mr. Fisher, may we have your name and address?

A. Herbert J. Fisher, Columbia, Missouri.

Q. What is your position, Mr. Fisher?

A. Fishery biologist with the Missouri Conservation Commission.

Q. In your duties in that commission have you had any experience with fishing on the Missouri River below Kansas City?

A. I have had some investigations on pollution and as far as commercial fishing are concerned.

Q. Yes, commercial fishing?

A. Yes.

Q. Are the commercial fishermen required to get a license from the State of Missouri?

A. They are, sir.

Q. What would you say the state of commercial fishing is in Missouri below the Kansas Cities area on the Missouri River? Is it increasing or declining?

A. It is definitely declining. During the past 13 years since 1947 it has become very apparent. Now, we have records of permits from the commercial fishermen and also a record of their equipment. In 1947 there was 172 licensed commercial fishermen in the area including Clay, Jackson, Ray and Lafayette Counties. In 1959--

CHAIRMAN WILSON: Just a minute. Mr. Fisher, will you tell us between what points on the river that territory extended?

A. Well, that would be the northern boundary of Clay County. We have just broken this material down by county.

CHAIRMAN WILSON: Where is that with reference to Kansas City?

A. Well, that would be probably a little bit north, slightly north of Kansas City.

CHAIRMAN WILSON: And how far down the river from Kansas City?

A. That would be some distance downstream from Lexington.

CHAIRMAN WILSON: So you are describing from a point a little north of Kansas City--

A. Just slightly north.

CHAIRMAN WILSON: --to a point just slightly below Lexington?

A. Yes.

CHAIRMAN WILSON: How many commercial fishermen did you say were licensed in that area in 1947?

A. 172. In 1959 47 were licensed, which is roughly a decrease of 73 percent.

Now, there was also a definite decrease in the number of licensed hoop nets, which are probably the most important commercial tackle. Let's see, in 1947 there were 315 hoop nets licensed in that area and in 1959 only 70 were licensed.

CHAIRMAN WILSON: Only how many?

A. 70.

MR. JOHNSON: This same area?

A. Same area. This was a decrease of almost 78 percent. In the meantime, in the rest of the river, not including these four counties, the decline in hoop nets was only 18 percent and in the number of fishermen only about 43 percent, so in comparison of the two there is a definite decline in the area below Kansas City.

Q. (By Mr. Stein) Did you ever get any reports in relation to your work on the effect of possible pollution in this area of river on the commercial fishing?

A. Yes, we have on record at least 22 separate commercial fishermen's reports complaining of the pollution in the river in and below Kansas City. Some of these are as recent as this past year. I think there are about four of five that are within this past year.

Q. Are there any indications that the taste of the fish in this area may be affected?

A. Yes. The fishermen complain mainly of the oily or ill-flavored fishes taken from this area, and although they are not always killed they are very difficult to sell because customers do not like to buy tainted fishes.

Q. What is the market reputation of fish taken from the Missouri River below the Kansas Cities area?

A. Not very good. We contacted a fisherman, an important fisherman, at Lexington in 1951 and he had quit at that time because he said that the fish tasted too oily to sell.

Q. Are there fish in the river?

A. Yes.

Q. Do you think that if there were no pollution in the river that there would be a market for these fish?

A. I think there would be, yes.

Q. If there were no pollution in the river and if there would be a market for the fish, do you think the commercial licenses issued by Missouri would increase?

A. Definitely.

MR. STEIN: No further questions of this witness.

CHAIRMAN WILSON: Cross-examination?

Q. (By Chairman Wilson) What species of fish are the principal catch of the commercial fisherman?

A. Carp, buffalo, catfish and drum.

Q And is there a market for those fish taken from water that is not polluted?

A Yes. Yes, sir.

CHAIRMAN WILSON: That is all I wanted to ask.

MR. KOENIGSDORF: That is very short.

CROSS-EXAMINATION

BY MR. KOENIGSDORF:

Q. You are talking about drop in these licenses since 1927.

A. 1947, sir.

Q. Since '47?

A. Yes.

Q. Were there 172 in '47?

A. Yes, sir.

Q. I think I got the figures wrong. And then what did you have in '59, was that it?

A. In '59 there was '47. 172 licensed fishermen in the area in 1947 and 47 in 1959.

Q. The question would still apply. There has been a big change in the flying in of frozen fish and the fish market since that time, has there not?

A. Yes, there has.

Q. The character of the trade has changed considerably?

A. That is right.

Q. I understand you to say that the State of Missouri required a permit for commercial fishing on the Missouri River?

A. Yes, sir.

Q. So they do exercise control of the river for that purpose, is that correct?

A. Yes.

MR. KOENIGSDORF: No further questions.

CHAIRMAN WILSON: Any other questions?

Q. (By Chairman Wilson) Have you any observations as to whether the pollution has affected the numbers of the fish population of these species that you described?

A. Well, we have records. The fishermen report the poundage of their catch and we have the records since 1945 and we have broken it down by counties since 1947. In that area in 1947 there was about 99,000 pounds of fish taken out of that area and in 1959 only about 22,000 pounds of fish were taken from this same area. That is the reports of the commercial fishermen. I did not mention that because it is their reports. The other material that I presented to you is actual concrete material that comes into our office. They would not be buying that license for tackle permits unless they were going to use them or spend the money for it.

Q. Well, obviously the fishermen's catch would be affected by other factors other than the size of the fish population. It would be affected by the amount of time and effort that the fishermen themselves devoted to their work, would it not?

A. Oh, yes, that is true.

Q. So that these figures that you have given us would not be a reliable index of the state of the fish population. What I was asking was whether you had any observations on which you could base an opinion as to how the pollution had affected the fish population itself?

A. In other words, you mean--

Q. If at all.

A. --if we have actually done some test fishing there ourselves?

Q. As to whether or not it had caused any decline or any increase in the fish population.

A. Well, these commercial fisheries reports definitely indicate a decline, that is a 78 percent decline in the production as they reported it. Now, as compared to the river as a whole, this is a much greater decline. There has been some decline on the river as a whole, but not nearly as much as it has in this one particular area.

Q. So that it would be your conclusion that there had been a greater decline in the fish population in this area resulting from the increasing pollution--

A. Yes.

Q. --than you observed elsewhere on the river?

A. Yes.

CHAIRMAN WILSON: That is all.

(Witness excused)

MR. STEIN: Mr. Chairman, I note it is five to five. We do have some rather lengthy witnesses and it might be appropriate to recess now rather than attempt to just get five minutes of a lengthy witness.

CHAIRMAN WILSON: Well, then, in accordance with our previous understanding, we will take a recess now until 7 p.m.

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WHEREUPON, the hearing was adjourned until 7 o'clock p.m. of the same day, at which time the following further proceedings were had and entered of record, to-wit:

- - -

EVENING SESSION, WEDNESDAY, JUNE 15, 1960

CHAIRMAN WILSON: The hearing will come to order.

MR. STEIN: Mr. Relf.

CLAUDE RELF,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. STEIN:

Q. May we have your name and address?

A. Claude Relf, 1001 East 78th, Kansas City, Missouri.

Q. What is your occupation, Mr. Relf?

A. I am a locomotive engineer.

Q. Where do you drive your engine in this vicinity?

A. Well, we cover quite a bit of the area here in Kansas City, primarily in, I believe you would call it, the Central Industrial District, Fairfax, in the Leeds area and the Northeast Bottoms.

Q. What railroad are you with?

A. Missouri Pacific.

Q. Do you drive an engine across the Kansas River?

A. Yes.

Q. Just about where is this in relation to the Turkey Creek Sewer?

A. It is below.

Q. Do you also drive your engine across the Blue River?

A. Yes. We do not go across so much as we do parallel it.

Q. Parallel the Blue River. But you spend a good deal of your occupational time in the Kansas River Valley near Turkey Creek Sewer and in the Blue River Valley?

A. In the last year and a half, yes.

Q. Have you seen the Kansas River and the Blue River on numerous occasions?

A. Daily.

Q. With reference to the Kansas River, in driving your engine, sitting in your cab, have you ever noticed any odors?

A. They are pretty strong.

Q. Would you care to describe the type of odors?

MR. JOHNSON: I didn't hear that.

A. I said they were pretty strong.

MR. JOHNSON: Thank you.

A. Describe them?

Q. (By Mr. Stein) What do they smell like?

A. I am not allowed to say in public.

Q. Well, I think--

A. I can't think of a word that I want to say. The odor is very strong, nauseating. A person with a weak stomach, it is offensive.

Q. Have you ever seen the Kansas River run red?

A. Yes.

Q. Do you see that on occasion?

A. Quite, oh, frequently.

Q. Have you any idea what makes it run red?

A. Well, it is coming out of a sewer right there below Swift Packing Plant. I supposed it was blood.

Q. Have you ever seen the Kansas River covered with foam?

A. Yes.

Q. About how high would you say this foam stood when you have seen it?

A. Oh, the whole river would be covered. It would be following the current and it would be foam right in along there six to eight inches high.

Q. Have you ever seen garbage floating in the river?

A. Always.

Q. Have you ever seen rubber contraceptives floating in the river?

A. Yes.

Q. Have you ever seen gas bubbles floating in the Kansas River?

A. Well, gas bubbles are there most of the time during the summer months.

Q. Have you seen people boating and fishing in the river?

A. Yes.

Q. Mr. Relf, in driving your cab, have you ever seen any serum plant operations?

A. The only part of the operation that we are able to see as we ride along is to look over into the pens.

Q. Would you describe what you see?

A. Well, these pens that are open usually have cattle and horses in them and these horses, particularly, will have large running sores on the different parts of the body. The cattle seem to be more of the--their members, that is the legs, seem to be swollen from some kind of a disease. We see that all the time. Now, the hog pens we cannot see into, so I don't know what they are.

Q. Did you ever see anyone clean those down?

A. Oh, yes.

Q. What happens?

A. Well, every--usually of an afternoon they will break out the fire hoses and hose these pens out.

Q. How about the animals with the sores?

A. Oh, they are still in there.

Q. And they hose them down too?

A. If they get in the road.

Q. And that stuff rolls right out?

A. It goes right down into, well, directly--these pens are right beside the Kaw River.

MR. SAMSON: Mr. Stein, I don't know that I followed you, but this flushing is on one side of the river, what was that?

MR. STEIN: Well, we haven't gotten to that yet. I was going to call Mr. Relf's attention to Government Exhibit No. 18.

MR. SAMSON: Oh, pardon me. I am sorry to interrupt you.

Q. (By Mr. Stein) This is Government Exhibit No. 18, which is an aerial map depicting the Kansas River. Now, Mr. Relf hasn't seen this, but I think he can pick this out. This is Turkey Creek right here (indicating).

A. Yes.

Q. Now, whereabouts would you think that serum plant would be?

A. That serum plant is right--yes. Now, correct me if I am wrong. Is this (indicating) not the stockyards?

MR. EDELMAN: Yes.

Q. (By Mr. Stein) Yes, it is.

A. And this (indicating) is the Missouri Pacific and the Union Pacific double bridge?

Q. Yes, it is, to the best of my knowledge.

A. This serum plant, then, will lay right in this bend right here (indicating), this area.

MR. SAMSON: You are indicating. You had better set up your--

Q. (By Mr. Stein) Will you point again so we can get it?

A. Between C-11 and C-12.

MR. SAMSON: On Exhibit 18?

MR. STEIN: On Government Exhibit 18.

CHAIRMAN WILSON: C-11 and C-12?

MR. STEIN: Yes.

A. Yes. They lay right beside--

MR. SAMSON: Where did you operate your locomotive?

A. Beg your pardon?

MR. SAMSON: Where did you operate your locomotive?

A. On this track, if you will notice, there is a rail comes right along the levee of the Kaw River here and turns and swings right back between these buildings here.

MR. SAMSON: That is on the Kansas side of the river, that is on the west side of the river, isn't it?

A. It is in Kansas.

MR. SAMSON: All right. Go ahead. Did you mention the name of the serum company?

MR. RIDGE: It wasn't very distinct.

MR. STEIN: I don't think Mr. Relf knows the name of the serum company.

MR. SAMSON: Very well.

MR. STEIN: But we will--I will ask him.

Q. (By Mr. Stein) Do you know the name of that serum company?

A. I believe it is Midwest. I won't swear for sure that it is Midwest.

MR. JOHNSON: Sir?

A. I believe that it is Midwest.

MR. JOHNSON: Thank you.

A. That could be wrong because it could have changed hands.

MR. STEIN: We have no further questions.

CROSS-EXAMINATION

BY MR. KOENIGSDORF:

Q. Mr. Relf, in the area that you work there are a lot of different odor-producing things, are there not?

A. There are many odor-producing things.

Q. The stockyards comes up with a pretty good odor sometimes, doesn't it?

A. Well, the stockyards, when you are crossing the river there you will never smell it, where we cross the river.

Q. If the wind is right you can't smell the stockyards from there?

A. You don't smell the stockyards so bad.

Q. Maybe you don't, but I think I would.

A. Well--

Q. You say the stockyards has no--

A. Oh, definitely, any place there is stock has odors.

Q. And this serum plant has odors, is that right or not?

A. Say that again, please.

Q. The serum plant, does it have odors or do you know?

A. The serum plant doesn't have very much odors. They keep it washed down pretty good.

Q. What other odors do you find around there?

A. Well, the most repulsive odors I find is when crossing the river and, of course, your packing house odors.

MR. KOENIGSDORF: No further questions.

CHAIRMAN WILSON: Any other cross-examination?

MR. JOHNSON: Yes, sir, I would like to ask a question.

CHAIRMAN WILSON: Go ahead.

Q. (By Mr. Johnson) Is it Mr. Relf?

A. Relf.

Q. Relf. I am concerned about the statement you made about these horses with sores. Does that mean that they are diseased horses that they take into this serum plant?

A. They are taken in as healthy--the way I--I cannot tell you whether they are diseased when they come in or whether they disease them there to get the disease, you know, to make the serum.

Q. I understand.

A. But there is running sores on the animals.

Q. And that is horses?

A. Horses and cattle.

Q. And this is a serum plant?

A. Yes.

MR. JOHNSON: Thank you.

MR. SAMSON: Excuse me. Go ahead.

CROSS-EXAMINATION

BY MR. BRENNEISEN:

Q. Mr. Relf, how close were you to these horses and cattle?

A. At times I am as close to them as I am to you.

Q. Well, do you put them in your cars?

A. Oh, no. No, you see, their pens run right up adjoining this rail, just a clearance point and that is all there is.

Q. Is this serum company north or south of the Central Avenue Viaduct?

A. Central Avenue?

Q. Yes.

A. I have got to stop and think. It is north.

Q. It is north of Central Avenue Viaduct?

A. Yes.

Q. Then you--

A. That would make it north of Wilson and Maurer--what used to be Mauer Neuer.

Q. Then you didn't have the right place there on the map, did you?

A. I think so.

Q. You were south of the Central Avenue Viaduct.

A. I will have to look. I can't tell you for sure. I will look.

Q. Why don't you look?

A. Now, is this Central Avenue here (indicating)?

Q. I believe it is.

A. Well, is this James Street (indicating)?

Q. On up, on up is James Street.

A. Where?

Q. Right there.

A. Oh, this (indicating) is the--

Q. Railroad bridge.

A. That is that railroad bridge that belongs to the Kansas Southern.

Q. Yes.

A. You are right, I have the wrong spot on that, because right here (indicating) is Sonken Galamba's junk yard, right here by this bridge, so that would move it up to here (indicating). But there still is the same characteristics here on rail.

MR. STEIN: Let's see where we are pointing now. That would move it between C-7 and C-8 on Government Exhibit 18.

A. I am sorry. That bridge there is what throwed me a curve.

CHAIRMAN WILSON: Then do we understand the witness's--

MR. SAMSON: I don't think this gentleman is through with his examination.

MR. BRENNEISEN: That is all.

MR. SAMSON: Oh.

CHAIRMAN WILSON: Yes, I understood he was through.

Q. (By Chairman Wilson) Instead of indicating a point between C-11 and C-12, you now correct that to indicate a point between outlets C-7 and C-8, is that right?

A. Yes.

CHAIRMAN WILSON: Any other questions?

MR. POOLE: Yes.

Q. (By Mr. Poole) As I understand it, your tracks run all along just parallel to the river there through that whole series of places that you were pointing to--

A. Yes.

Q. --from maybe C-15 to C-20?

A. They do. We follow the levee all along there.

Q. Well, do you see horses and cows of the kind you have described in any other location other than this point you have been talking about?

A. Well, you see them down--you can see them down by the packing plants and further down at the stockyards, of course.

Q. But there is only one location--

A. Yes.

Q. --other than the stockyards locations where you see them?

A. You see them at the stockyards and then you see them at Maurer--or at Wilson Packing Plants, you can see cattle there.

MR. POOLE: That is all.

A. And then go further downstream and find them there.

Q. (By Mr. Samson) I just wanted to clear up one thing, Mr. Relf. You referred to that as the Midwest Serum. Is that the Missouri Valley Serum Company, if you know, or do you know?

A. I can't swear.

Q. All right.

A. It has changed hands, I understand, sometime.

MR. SAMSON: Very well. That is all.

CHAIRMAN WILSON: That is all.

MR. STEIN: Thank you, Mr. Relf.

(Witness excused)

MR. STEIN: Mr. Metzler.

Mr. Chairman, Mr. Metzler is here also as a party representing Kansas. We believe it would expedite matters if Mr. Metzler could make a statement. I think the material will be able to be presented in a more rapid manner that way.

CHAIRMAN WILSON: Very well. Mr. Metzler.

MR. SAMSON: Does he have a copy of his prepared statement for all the parties involved?

MR. STEIN: Yes, I think the counsel table has had a copy of that statement.

MR. JOHNSON: How about the Board?

MR. METZLER: I am very apologetic about this. I have one additional copy. I should have prepared copies for all the Board members. I really didn't expect to be on today.

CHAIRMAN WILSON: For the benefit of the reporter, Mr. Metzler, it is understood that right now you are going to read from a prepared statement?

MR. METZLER: I expect to read and I will tell the reporter when I deviate from the prepared statement. I will make some deviations from this.

CHAIRMAN WILSON: Okay. Just be careful to do that so she will know whether or not she has to take verbatim what you are reading.

MR. METZLER: Thank you, Mr. Chairman.

DWIGHT F. METZLER,

called as a witness on behalf of the State of Kansas, being first duly sworn, testified as follows:

DIRECT TESTIMONY

THE WITNESS: The State Board of Health is the official water pollution control agency of Kansas, and its Division of Sanitation also has responsibility for controlling those environmental hazards which adversely affect the public health. The water pollution control statutes, first enacted in 1907, charged the Board with the abatement of pollution which adversely affects health or other beneficial uses of the state water resource. In excess of $150,00 of state funds are appropriated for this purpose each year.

Kansas is concerned about the public health hazards created by the discharge of untreated sewage to the Kansas and Missouri Rivers in the Kansas City area. It is also vitally interested in the wide use and conservation of the resource represented by these two rivers. Experience has shown that harmful pollution must be controlled in order to permit the maximum future development of this resource for municipal and industrial water supply, recreation, irrigation, navigation and other beneficial purposes.

At this time the control of water pollution and the maintenance of reasonable water quality are essential goals of the Missouri River Basin Development Program. Existing pollution must be abated if present uses of the basin's streams are to be maintained and if future potential uses are to be realized. This has been done or is well under way in the Kansas River Basin, once one of the two major sources of tributary pollution to the Missouri River. Members of the Hearing Board will remember that the Floyd River at Sioux City was the second source.

The Kansas State Board of Health has carried out an active program of water pollution control since 1907. Despite the construction of sewage treatment plants in the Kansas River Basin prior to 1947, the rising fecal bacterial loading at municipal water intakes and other indications at that time suggested that a detailed investigation of pollution conditions was warranted. This was undertaken for the entire Kansas River Basin by Nebraska, Kansas and three federal agencies. Intensive and comprehensive field and laboratory studies were conducted over the period of a year and were completed in December 1948. The chemical and bacteriological results and other findings of the survey were analyzed and assembled into a formal engineering report. Following distribution of this report to interested persons in Kansas, the Kansas State Board of Health held public hearings throughout the Kansas portion of the basin in March 1950.

On the basis of the report and the testimony at the public hearings, the State Board of Health subsequently adopted a uniform pollution abatement policy applicable to all cities and industries in this basin, which includes approximately the northern half of the state.

I would like to add this word. Members of the Hearing Board will remember that Kansas is roughly 200 miles north and south and about 400 miles east and west. This basin is almost exactly 100 miles north and south and a full 400 miles east and west.

This cleanup program is now essentially complete on the Kansas River above the Kansas City Metropolitan Area. Since 1950 sewage treatment plant construction projects have been completed in 81 communities. All 129 communities with sewer systems above Kansas City in Kansas treat their wastes. In the majority of these cities both primary and secondary treatment of sewage is provided, although the larger streams provide sufficient dilution for a few cities so that only primary treatment is needed. The 81 new plants which have been built in the Kansas portion of the Kansas River Basin in the last ten years have cost approximately $14,600,000. Industries have spent an additional $14,200,000 for waste disposal. The average per capita cost for the cities has ranged from $24 to $172, with the lowest cost occurring on a contract let in 1953. Both the total costs and the per capita costs do not include the cost of interceptor sewers or other sewers. Of course per capita costs are higher for secondary treatment than for the primary treatment which is proposed along the Missouri River, and they are higher in the small cities than in metropolitan areas since some savings are inherent in construction of large projects. In any event, the costs of providing treatment have been reasonable and in no case have they been prohibitively high. The Kansas position is that the full benefits of the Kansas River Basin cleanup cannot be realized until a similar program is completed in the Kansas City Metropolitan Area.

I would like to at this point depart from the prepared statement for a minute to discuss coliform loadings. The Board must wonder on the basis of the testimony which it has received of high coliform concentrations found during the week of sampling at Bonner Springs as to where this coliform pollution originated. There are many hazards in sampling over a short period of time. These are recognized and the handicaps are recognized by all of you.

We have data which we have collected over a period of years which shows coliform loadings at Topeka, which is the last station where samples of the raw river water are taken regularly. There is a great variation in these concentrations. For instance, in the year 1957 the raw water coliform quality ranged all the way from 36 per hundred milliliters to 240,000 per hundred milliliters, with quite a number of the samples in the under 1,000 coliform per hundred milliliters.

In 1958 this range is from 2,300, again, to 240,000 and in 1959 the range is about 2,300 to about 210,000.

I mention this testimony primarily as a prelude to explaining the relatively high coliform loadings that we experienced in the Kansas River during certain flows. At times of flood or stream flush-out that need not be flood we get very high coliform loadings. When the river is back down at normal and, of course, at below normal flows the coliform loadings are much decreased. The sampling at Bonner Springs, if I remember correctly, occurred during a period that was at the end of higher flows and while I don't have the figures in front of me it seems to me that during the week of sampling the flows decreased from something like eight or ten thousand second feet to perhaps four thousand to forty-five hundred second feet. Even these latter flows are above median flows for the Bonner Springs station.

This is not significant in the presentation of the government's evidence since the government's evidence shows great increases in the coliform concentrations as the Kaw River or the Kansas River flows through the Kansas Cities Metropolitan Area. But I do offer this as an explanation, so that it may temper the Board's judgment as to the improvements which have been made upstream and the benefits of these improvements. Should you have some questions about that afterward, I would be glad to attempt to answer them.

Back to the text.

Along the main stem of the Missouri River, Kansas, the other Missouri Basin states and the U. S. Public Health Service agreed in 1949 to make a study of pollution conditions from Yankton, South Dakota, to St. Louis. As its contribution, Kansas made the pollution studies in Kansas and provided laboratory services for some of the stations in Missouri. These data were analyzed and presented in the 1952 report of the U. S. Public Health Service, "Water Pollution Investigation, Lower Missouri River Basin", which was distributed to interested parties. And I underline this since there was some testimony earlier in the hearing that some of the industries and perhaps others had not received copies of the report. They would have an opportunity to check this and we apparently mailed these out in July of 1953.

At a conference of representatives of the lower Missouri River states and the Public Health Service in September 1953, Kansas agreed to participate in a uniform pollution abatement program along the main stem of the Missouri River.

The Kansas State Board of Health formally adopted a policy at its meeting on December 11, 1953, calling for "primary treatment of all sewage, the elimination of toxic compounds from the waste discharges, notification of all cities involved . . . . and review of the progress in January 1955, by the states and the Public Health Service." Additional reviews were contemplated. Kansas Cities and industries were notified of the Board's action.

Kansas was represented at the December 1957 conference called by the U. S. Public Health Service at Kansas City, Missouri, regarding pollution in the Kansas City Metropolitan Area. The statement presented at that time is included in the transcript of the conference, and the information it contained will not be repeated here. Since that time the Kansas State Board of Health has been working steadily with Kansas City, Kansas, the Fairfax Drainage District and the industries in the area to obtain compliance with the conference conclusions.

Kansas contributors of waste to the main stem of the Missouri River are Atchison, Leavenworth, Fairfax Drainage District, Kansas City, Kansas, and some smaller sewer districts to the west of Kansas City, Kansas. The City of Atchison has a sewage treatment plant now under construction. The detailed construction plans for sewage treatment facilities at Leavenworth are complete and the award of a construction contract is to be made on or before September 30, 1960. Both Atchison and Leavenworth are in compliance with schedules approved by the Kansas State Board of Health.

For several years, progress toward treatment by Kansas City, Kansas, the Fairfax District and nearby industries has been slow; this has been due in part to the well-publicized lack of progress in Kansas City, Missouri. For example, Kansas City, Kansas, passed a $3,700,000 bond issue by a six to one vote to construct sewers and to buy treatment plant sites in November 1954. Under the influence of the slow rate of progress being made by its sister city, however, Kansas City, Kansas, did not obligate some of this money for construction until 1959.

In the spring of 1959 the Kansas State Board of Health staff initiated a plan of monthly meetings with the Kansas City, Kansas commission to evaluate progress toward sewage treatment. These meetings were productive and beginning in June 1959 satisfactory progress was made with engineering studies, work with large waste-producing industries and financial investigations between each meeting.

The Board's Kansas River Basin policy of 1950 had set a January 1, 1960, target date for starting the construction of treatment works. Since the city and the Fairfax District would not meet this date, the Board called both to a hearing on December 14, 1959, to show cause why their permits to discharge sewage should not be revoked. Both public bodies presented plans for solving their waste treatment problems, including proposed time schedules. These were accepted and made a part of Board orders as shown on the attachments. And I have the attachments of the Board orders here which we can file or handle in any way that you want to. Let me read the dates that are involved, Mr. Chairman. For Kansas City, Kansas, adopt a sewer service charge April 1, 1960. July 1, start construction of Turkey Creek Sewer. August 1, 1960, pass the condemnation ordinance for sewer treatment plant site.

CHAIRMAN WILSON: Did I understand you to say August 1, 1960?

THE WITNESS: August 1, 1960.

CHAIRMAN WILSON: Oh, you mean that is a future date that they have set?

THE WITNESS: I am sorry. The dates that I have read are dates which are included in the Board order to Kansas City, Kansas.

CHAIRMAN WILSON: Go ahead.

THE WITNESS: November 1960 hold a bond election. January 1, 1961, authorize final plans and specifications for treatment. And July 1, 1962, place sewage treatment plant under construction or in advance of Kansas City, Missouri. Now, concerning the Fairfax Drainage District, these dates were as follows: May 1, complete a feasibility report on sewage treatment. January 1, 1961, completion of detailed plans for the separation of wastes and for treatment. March 1, 1961, start construction of treatment works. July 1, 1962, complete construction of treatment works.

Some Kansas industries have separate outlets, as has already been covered in the hearing, but the Board should understand that the industries, particularly the major industries, have indicated thus far their desire to proceed with the city, and the Board's action has been taken with the assumption that this would occur. If it does not, the Board's intention would be to enforce the same schedule for individual treatment plants, which would be built by industry should any industry decide not to go with the city, as has been set up for the city.

Now, this concludes a brief summary of a history of pollution abatement proceedings by Kansas along the main stem of the Kansas River and in the Kansas River Basin.

I would like to discuss now the discharge of sewage by Kansas City, Missouri, into water courses which subsequently enter Kansas. Kansas also has an additional concern in sewage and industrial wastes originating in the O.K. Creek and Turkey Creek drainage areas within Kansas City, Missouri, since this sewage is carried into Kansas and discharged into the Kansas River without treatment. The Kansas State Board of Health assisted in collecting the technical data delineating the seriousness and extent of this pollution and its effects on the receiving waters. These data have been presented by other witnesses, so they will not be repeated here. Even the most casual observation, however, as those who took the boat trip will verify, will support the contention that the Kansas River in Kansas from the point of entrance of sewage from O.K. and Turkey Creeks to the mouth is an elongated cesspool.

Perhaps graphic illustration will serve to complement the technical description of pollution which has been presented. For example, the solids from the Kansas City, Missouri, wastes entering Kansas from the Turkey Creek Sewer will fill a five-yard dump truck every ten minutes day and night. There would be 144 five-cubic yard loads a day. That these solids are diluted with water should not obscure the fact that the damages are the same as if these trucks were backed up regularly every ten minutes day and night and allowed to dump five cubic yards of sewage sludge into the Kansas River. There can be no question that Kansas and Kansas City, Kansas, in particular suffer heavy damage as a result of the failure of Kansas City, Missouri, to treat these wastes.

The public health hazards attendant to the discharge of untreated sewage in such large quantities that sludge banks of septic decomposing organic matter accumulate are well known. When this occurs in a densely populated industrial-commercial area and close to residences, the results are even more serious. The use of the river for recreation is hazardous and the potential use of this reach of the stream as a water supply for industries is virtually eliminated.

As previously stated, the full benefit of the improvements which have been accomplished in Kansas as a result of the Kansas River Basin cleanup cannot be realized until sewage from all of the metropolitan area is treated. As one example, the water in the highly polluted reach of the Kansas River near its mouth is frequently devoid of dissolved oxygen. This acts as a deterrent to the upstream and downstream movement of fish and other aquatic life, and at low river stages serves as a complete barrier to the migration of fish.

Now a few words about the schedule for abatement. Repeated reference has been made in this hearing to the complex pollution problem resulting from the wastes from many outlets under several jurisdictions.

That treatment of a part of the wastes will not alleviate the problems is acknowledged.

I want to emphasize the necessity for uniformity of construction schedules between public bodies in Kansas and those in Missouri. The Kansas schedules for collection and treatment of all wastes have already been reviewed. The Kansas State Board of Health believes that these are reasonable and that the industries and public bodies expect to meet them. It urges that the dates which are set for Kansas City, Missouri, be comparable. This includes the schedule for the treatment of wastes to the Missouri River as well as those to the Kansas River. While downstream water users will receive some benefits from the treatment of the wastes originating in Kansas even if the wastes from Kansas City, Missouri, continue to flow untreated, Kansas should not be penalized by having to provide these substantially in advance of Kansas City, Missouri, and North Kansas City.

These remarks are not to suggest that Kansas communities and industries should be given additional time. Our Board denied this when Kansas City, Kansas, asked to condition its contract letting date upon the letting of contracts by Kansas City, Missouri. Instead these remarks are to indicate that immediate and definitive action is necessary on the part of Kansas City, Missouri. Perhaps a pay-as-you-go plan would have been practical had it been started in 1950 when the city was notified of its damage to Kansas through discharges from the Turkey Creek Sewer. Ten years and many promises later, action is needed. Any promise which ties the financing of waste treatment works to a bond election for sewers is not acceptable to Kansas. Neither is the pay-as-you-go plan acceptable because of the delays this plan entails. The city governing body states that it has the authority to make a service charge and issue bonds to finance construction. The authority for doing so rests clearly with it.

The need, then, for waste treatment has been demonstrated. We believe the city council's duty is to issue the bonds to start this program.

Now, again departing from the prepared statement, I would like to review for the Board what we consider to be the principal sources of pollution in Kansas. The Board already has data concerning the amounts and I will not confuse you by repeating these or giving you some that are slightly different. But I would like to review these and also to answer questions about a couple of outlets which have been mentioned by previous industrial witnesses.

Do we have a chart, then, showing perhaps a little more of the Kansas side of the line than this one does?

MR. STEIN: That is Government Exhibit No. 14. I think the Board and all counsel are supplied with that. And that covers the whole area.

THE WITNESS: May we start, then, in reviewing this at the northern end at the Fairfax Drainage District.

The Fairfax Drainage District includes a group of industries. It has a very substantial waste load. It has some major problems of separating relatively uncontaminated storm and cooling water from its sanitary and industrial wastes.

MR. SAMSON: Are you referring to the Fairfax Drainage District?

THE WITNESS: I am referring to the Fairfax Drainage District, which is the legal name of what is sometimes referred to as the Fairfax Industrial District.

MR. SAMSON: Is that the same area as is set out on Government Exhibit 14?

THE WITNESS: So far as I know, yes, Mr. Samson.

MR. SAMSON: All right, very well.

THE WITNESS: Then the next major source of pollution is that from numerous sewers coming in from Kansas City, Kansas. And these also have been described and the collection of this waste in an interceptor sewer and eventual treatment is covered by the State Board of Health's order.

There are three industrial outlets which deserve special mention. A large waste producer, potential waste producer, is the Phillips Refinery Company, which is at the lower end, that would be the southern end, of the Fairfax Drainage District.

CHAIRMAN WILSON: Can you designate that by number as indicated on this Exhibit 14, which is the Phillips outlet?

THE WITNESS: This would be, I believe, F-9, F-10, F-11. Would that be correct?

CHAIRMAN WILSON: The tabulation is at the left of the map.

MR. SAMSON: It is indicated as such on the --

THE WITNESS: Oh, thank you. This refinery has been carrying out a waste reduction and waste treatment program in phases for several years, and actually had started on this in advance of the conference which was held in December of 1957. It is now about to enter upon the final phase of this program and it is the one industry in the Fairfax area which will be treating its own wastes instead of discharging its wastes to the Fairfax Sewer System.

The BOP plant was mentioned yesterday and this two and a half-inch sewer with some acetylene wastes--

MR. SAMSON: That is Buick-Oldsmobile-Pontiac?

THE WITNESS: Buick-Oldsmobile-Pontiac. There was a little lack of coordination there because last Thursday the manager of the plant told me that he thought that they would abandon this sewer because they would probably go to a different method of obtaining acetylene gas. If they should not, their plans are to tie this in with the rest of their wastes to the Fairfax Drainage system.

CROSS-EXAMINATION

BY MR. STEIN:

Q. Mr. Metzler, does that outlet described from the BOP plant have the approval of the Kansas State Board of Health?

A. No, they have no permit for that.

Q. Do you consider that an adequate method of waste disposal?

A. No. This would require a permit and would require--and the waste from this would require treatment. As a matter of--

Q. You would not issue a permit under your present law and regulations the way it is now?

A. We would not. The other was the gentleman who testified this morning for the National Cylinder Gas Company. Is this right?

Q. That is right.

A. Again this waste will be removed from the river either by their own treatment or under contract with Kansas City, Kansas.

Q. Mr. Metzler, does this waste discharge have a permit from the state?

A. This waste discharge does not have a permit and it would have to be treated in order to receive a permit.

Q. You do not consider this, then, a satisfactory improvement to the Kansas River to help the river?

A. The addition of sludge from acetylene welding does not improve the condition of the Kansas River.

MR. STEIN: Thank you.

MR. POOLE: I have a question. I didn't know whether he was through or not.

Q. (By Mr. Poole) I wanted to find out about Phillips Petroleum. Are they under permit from the Kansas State Board of Health?

A. They are under a temporary permit, but they will not receive a regular permit or an unclouded title, as it were, until they have completed this next step of their treatment program.

Q. The information I have says they have three and a half million gallons of waste. That is about all I have been able to find out about it.

A. I would be glad to discuss this in some detail, but I think it may be repetitious over the statement which Phillips will make. May I suggest to Mr. Poole, if this is satisfactory, if he has any questions about this after Phillips makes its presentation to the Board that I will attempt to answer them.

Q. Well, I will just ask you one now.

A. Yes.

Q. In your opinion is Phillips as it now stands contributing to the overall pollution of the interstate waters? And you have heard the evidence this afternoon about taste and odor difficulties, et cetera.

A. Phillips is still contributing to the pollution of interstate waters. It has removed the more offensive pollutants since December of 1957.

CROSS-EXAMINATION

BY MR. KOENIGSDORF:

Q. Mr. Metzler, did you know that Missouri has a water pollution board?

A. Yes.

Q. Do you think they are qualified men?

A. I am not acquainted with them, but I am certain that any group of men appointed to such a body as this would be well qualified. I know one member and I am--

Q. Don't you think you have got enough trouble taking care of the State of Kansas without taking care of the State of Missouri too?

A. It seems to me, in answer to your question, that the downstream people cannot benefit substantially from all the people in Kansas treating their wastes unless Kansas City, Missouri, also treats its.

Q. How many of these dump trucks you are talking about --I think you said there would be five of them filled from Turkey Creek; let's add a few more--how many would be filled from Kansas and its industries on the Kansas side in that same period of time?

A. I said there would be six an hour, 144 a day, five cubic yards to the truck.

Q. That is out at Turkey Creek, isn't it?

A. That is out at Turkey Creek.

Q. Let's take the rest of the sewer outlets.

A. There would be even more than this filled from Kansas. The pollution from Kansas is detrimental to the downstream interests and we are moving to see that it is corrected and we are getting good cooperation from our governing bodies on the Kansas side of the line.

Q. Well, I am not really worried about what you do in Kansas. But this idea of letting George do it--in other words, you think you ought to wait until somebody else does it before you do something, but you have got a good many more dump trucks than we have?

A. This is not the case.

Q. Oh, isn't it?

A. We are doing something about it, but we would like to see Kansas City, Missouri, moving in this general direction too. The Kansas State Board of Health is quite serious about this matter of these dates and it expects to enforce them and the attorney general's office tells us that we have the responsibility to enforce it. We believe, however--

A. I am convinced the Missouri Board is serious about their dates too.

MR. JOHNSON: May I ask a repeat of that?

MR. KOENIGSDORF: I say I am convinced the Missouri Board is serious about their dates as well as the Kansas Board is serious about theirs.

A. We have one small advantage, if the Chairman doesn't mind my pointing it out, and that is that we have 53 or 54 years of experience under this law and without its being successfully challenged in the courts.

Q. (By Mr. Koenigsdorf) Our Board isn't quite so experienced, is that the idea, or what?

A. You don't have this long a history of legal decisions back of the action, so there is probably some unproven legal ground here.

Q. As I understand your testimony about the Bonner Springs coliform count, you referred back to Topeka for the purpose of showing that you can't determine by a particular time what the coliform count is going to be. Was that the gist of your statement? You can't just take one reading and say what the coli count is.

A. I was attempting to show, and I might not have done it very well, that there is a great variation in the coliform concentration, but that the peaks seem to occur at times of high flow and substantial runoff and in general in times of high turbidities.

Q. I gathered from your testimony that you didn't think that 110,000-plus was an accurate presentation of the coliform count at Bonner Springs.

A. I intended to give the impression that this was no doubt the coliform count during the period in which sampling occurred, but that this should not be taken as an average annual figure.

Q. And you would say the same thing is true, then, of the coli figures below Turkey Creek, is that correct, sir?

A. Yes

Q. So these figures are subject to a great deal of variation, then, depending upon when you take them, is that right?

A. They are subject to a great deal of variation.

Q. You went from almost zero--I think you say 36, was that right, at one time at Topeka?

A. That is correct.

Q. --to 240,000 all in the same year.

A. The significant part of this, if I might volunteer the information--

Q. Yes, sir.

A. --is the increase in coliform concentration as the river flows through the area and receives the wastes from the metropolitan area on both the Kansas and Missouri sides.

Q. Wastes and runoff, I assume, are present in both places below Turkey Creek and above Turkey Creek, are they not?

A. You mean surface runoff?

Q. Surface runoff.

A. I am sure there is some surface runoff.

Q. Now, sir, taking your statement that probably this is a high point or at least it is not to be taken as the average, is it conceivable that we would ever be able to get down to what has been referred to as an objective standard year round in the Kansas River area?

A. Does this assume treatment on both sides?

Q. Yes, sir.

A. You can't do this without a high degree of secondary treatment or chlorination, terminal chlorination.

Q. If nothing were done above Bonner Springs or above Turkey Creek, and that is running 100,000-plus at times, and you say it is 85 percent completed in treatment, if I gathered your figures correctly, is it ever possible that you would get down to the objective standard when you treat it?

A. This is just the point of my presentation, is that at average and lower than average flows when we are not getting the influence of flush-out, runoff, land runoff, barn lot runoff, and so forth, that we are down in this range, but that the higher flows we are so far away from this range that there is no comparison.

Q. At certain times of the year you would probably exceed 100,000 no matter what was done below Turkey Creek?

A. I don't know.

Q. You have 110,000 at Bonner Springs. Wouldn't that be safe to assume, then?

A. One might make this assumption.

MR. KOENIGSDORF: Thank you.

CHAIRMAN WILSON: Any other questions?

MR. JOHNSON: Yes, I have a question.

CHAIRMAN WILSON: Go ahead.

Q. (By Mr. Johnson) Mr. Metzler, I am concerned about a few statements at the latter part of this thing, following "Ten years and many promises later". What I am concerned about is this. In this statement it says, "Neither is the pay-as-you-go plan acceptable because of the delays this plan entails. The city governing body states that it has the authority to make a service charge and issue bonds to finance construction. The authority for doing so rests clearly with it."

My question, Mr. Metzler, is this: The pay-as-you-go plan is not acceptable to you, is that right?

A. This plan is not acceptable if this means what I have read in the newspapers and taken it to mean, that is that the city construct as it has money to pay for construction, because this entails stretching out the program over too long a period of time.

Q. I am aware of that. I am also aware of the fact, and I am sure you are, that the city's contention is that it would save a tremendous lot of interest money for the citizens of Kansas City as respecting issuing bonds. You have taken that into consideration, I am sure?

A. I have, and I confess I can't feel any great pangs of pain here when I know that we are talking about a per capita cost of $38 when people out in essentially farming communities in Kansas have paid $150 and $175 and have borrowed all the money to do it. I see no reason why we should on the basis of poverty permit Kansas City, Missouri, to delay a program which other communities are also having to borrow to finance.

MR. JOHNSON: Thank you very much for that statement.

CHAIRMAN WILSON: Any other questions?

MR. SALOME: I would like to ask a question here. I would like to get this in the record.

Q. (By Mr. Salome) I think you made it fairly clear, but let's repeat. Has Kansas City, Kansas, and the Fairfax Industrial District complied with their request and have arranged a schedule that meets with the State Board of Health's requirements?

A. The Fairfax Industrial District has met every part of the order of the Board to date.

Q. All right.

A. Kansas City, Kansas, is neglecting in one aspect. It promised the--well, in its proposal to the Board it offered to enact a sewer service charge by April 1, 1960. It placed this charge on reading--it placed the ordinance for this charge on reading, but has not completed the passage of the ordinance and if Kansas City, Kansas, is to escape further action on the part of the Board it will need to ask and receive permission to extend this time, and our Board happens to be meeting on Friday of this week. In this respect they have not met the schedule.

It seems to me that there may be some justification. In an attempt to convince all the industries and get full treatment in its community, and they have done a good job so far, it has agreed to further studies and further hearings on the part of its major industries.

MR. SALOME: Thank you.

CHAIRMAN WILSON: Any other questions?

Q. (By Mr. Ridge) Are there any other jurisdictions in Kansas that are contributing outside of Kansas City, Kansas, and the Fairfax Industrial District?

A. Yes, there are some small drainage districts--and I am glad you asked that question; I should have mentioned it--just to the west of Kansas City, essentially adjoining Kansas City, Kansas, which will either provide their own treatment facilities or which will tie into an interceptor sewer connecting to the Kansas City, Kansas, sewer system. These drainage districts are very small as relates to the total load here. I am sure that the total waste wouldn't exceed 5,000 persons. These are under order and have the same dates set upon them by the State Board of Health as has Kansas City, Kansas. And within the next 30 days they will have to make a final decision to either treat their wastes in their own treatment facilities or to contract with Kansas Ctiy, Kansas, to do it.

Q. When you say west, does that include the Argentine District which is the other side of the Kansas River?

A. This does not include the Argentine District.

Q. You didn't mention that as far as compliance, or is that--

A. The Argentine District is a part of Kansas City, Kansas.

MR. RIDGE: Oh, it is? Well, that is fine.

CHAIRMAN WILSON: Any other questions?

MR. POOLE: I have one.

Q. (By Mr. Poole) Well, I can't find it; it is back several pages in my notes. But this afternoon there were four townships mentioned which I presumed were in the same county Kansas City, Kansas, is in--

MR. SAMSON: Mission Hills, I think.

Q. (By Mr. Poole) --and also another county which I assumed was an adjoining county, and the statement was made they had a large group of people. Now, my question is are these a part of the Kansas City, Kansas, metropolitan area, will they be served by its sewers, or are they in the small drainage districts you referred to?

A. May I use the map to answer this question?

MR. STEIN: Yes. May I point this out, Wyandotte and Johnson Counties and Quindaro and Shawnee Townships, I think, were the ones mentioned.

A. All right, if I may use this map, which is Exhibit No. 13, in pointing these areas out about which we are discussing. The largest area that was mentioned was that in Johnson County, which is the county adjoining Wyandotte County to the south. Johnson County is frequently referred to as the bedroom of Kansas City and is a very rapidly-growing housing area. In this area there are a number of sewage treatment facilities. One, the Mission Township Sewer District No. 1, discharges into the Kansas River drainage and then thence into the Missouri River. This facility is designed to treat the sewage from 72,000 people and it has a very adequate, high degree of secondary sewage treatment.

The other drainage districts are farther to the south. They also have adequate sewage treatment and discharge into Indian Creek, which in turn is a tributary of the Blue River, and flows back into the Missouri River on the eastern side of Kansas City.

The answer, then, in brief, in Johnson County all of these housing areas are served by sewer districts created under the authority of the county commissioners with a good staff and with a high degree of treatment.

Q. (By Mr. Johnson) And adequate sewage treatment?

A. Adequate sewage treatment in all cases.

Q. (By Mr. Poole) All right, will you come back to the townships?

A. Now to come back to Quindaro and Wyandotte Townships, which are for all practical purposes essentially on the edge of Kansas City, Kansas, the western edge. These have some sewer districts. I am sorry I don't have the numbers here. Each township forms one or more sewer districts. I believe that there are four sewer districts in this area serving relatively small groups of houses, but which have constructed sewers with the plan that either an interceptor will be constructed along the Kansas River here to tie into the Kansas City, Kansas, system or that these will provide treatment.

Now, the population is small in comparison to the figures we are talking about elsewhere. These sewer districts have ample authority to to levy taxes and to issue the bonds necessary to build these facilities.

MR. POOLE: Thank you.

CHAIRMAN WILSON: Any other questions?

Q. (By Chairman Wilson) I would like to ask you a few questions, Mr. Metzler.

MR. JOHNSON: There is a gentleman over here.

CHAIRMAN WILSON: Oh, I beg your pardon. Go ahead.

MR. KOENIGSDORF: No, sir, go ahead. I have a matter, but I will take it after you.

MR. BRENNEISEN: Let me. I am right along the same line.

CHAIRMAN WILSON: Go ahead, counsel. Maybe you will anticipate what I have in mind, so go ahead.

CROSS-EXAMINATION

BY MR. BRENNEISEN:

Q. Mr. Metzler, isn't it true that there is raw sewage being discharged from Johnson County down the Turkey Creek Basin into Kansas City, Kansas?

A. Not to my knowledge.

Q. Not to your knowledge? Weren't we present in meetings where we discussed getting together with Johnson County and building a Turkey Creek Sewer and trying to get it financed between Kansas City, Kansas, and Johnson County or part of Johnson County and a township in Wyandotte County?

A. Yes.

Q. Well, wasn't this sewer to serve a fairly large population in Johnson County?

A. Yes.

Q. Now, when you stated here that these townships in Wyandotte County had a population of about 5,000, you weren't certain of that, were you?

A. No, I was not.

Q. You could be underestimating that very substantially, couldn't you?

A. I might be.

MR. BRENNEISEN: That is all.

CHAIRMAN WILSON: Just a minute. Mr. Metzler indicated his assent to that question by nodding. I wonder if the reporter got it. Please speak up, Mr. Metzler, and answer yes or no. What was your answer to that?

A. I said essentially, I believe.

MR. BRRNNEISEN: One other question.

Q. (By Mr. Brenneisen) You stated that the Argentine Industrial District is in Kansas City, Kansas, that is true, isn't it?

A. Yes.

Q. There is another large industrial district west of there, though, that is not in Kansas City, Kansas, isn't there?

A. That is correct, and this was not mentioned.

Q. And that contributes sewage too, doesn't it?

A. There is sewage from industries which flow through a structure into the Kansas River that belongs to the drainage district, I believe, yes.

If I might clarify this point for the Board, the Turkey Creek is a second Turkey Creek originating up in Johnson County and draining down to the Kansas River in Kansas flowing through a part of Wyandotte County. There is septic tank drainage, probably raw sewage, from individual homes discharged into the surface course in that stream. To the best of my knowledge, there is no raw sewage coming in from housing areas, that is areas served by a community sewer system.

The Board might also be interested to know that this area has voted bonds for a comprehensive sewer system that will permit them to abandon a number of interim sewage treatment plants and which will treat all of the sewage in Johnson County in this Turkey Creek drainage. Unfortunately, we were not able to surmount all the hurdles which would have permitted carrying this on down through Turkey Creek drainage in Wyandotte County and treatment at the Kaw River or in that vicinity.

CHAIRMAN WILSON: Any other questions?

MR. KOENIGSDORF: May I ask one, sir?

CROSS-EXAMINATION

BY MR. KOENIGSDORF:

Q. Mr. Metzler quoted from what he had read in the Kansas City Star, I believe he was talking about the Kansas City Star, in which he said it would be ten years on a program. I don't believe he read the paper correctly.

A. May I restate what I said, Mr. Counselor?

Q. Yes, sir.

A. What I said was "Ten years and many promises later." This was 1950 to 1960. This was the period to which I referred.

Q. You are not talking about the plan which has been adopted recently by the council and presented to our state water pollution board?

A. I was not.

Q. Do you know about it?

A. I have read the statement which you presented to the Missouri Water Pollution Control Board.

Q. I forgot to ask you how many dump trucks it would take to carry Kansas sewage that we carry along our Missouri sewer lines in Turkey Creek away, the part that originates in Kansas. How many dump trucks would we have to have for that that we would carry for you?

A. I didn't calculate it, but it would be a good many dump trucks.

MR. KOENIGSDORF: Thank you.

CHAIRMAN WILSON: Any other questions?

Q. (By Chairman Wilson) Mr. Metzler, you made some observations on the variations of coliform density?

A. I did.

Q. You yourself are a sanitary engineer of long experience?

A. Well, a little experience.

Q. You have been here throughout the hearing, have you not?

A. I missed a part of the hearing, a good share of the hearing on Monday, Mr. Chairman, and was not here Tuesday afternoon.

Q. You were here yesterday?

A. No, I was not here yesterday afternoon.

Q. Oh. What I wanted to ask you was whether you heard Mr. Kittrell's testimony?

A. I heard Mr. Kittrell's testimony as he concluded it this morning. I did not hear the portion yesterday afternoon. One of my staff members attempted to fill me in on this; he was here.

Q. Did you hear Dr. Walton's testimony?

A. I did hear Dr. Walton's testimony.

Q. What I wanted to ask you was this: Assuming that both of these gentlemen, and other witnesses for the government, have expressed some conclusions as to the pollution load of the various waters that we are concerned with based upon their observations and tests of coliform density which were made at certain different times and taking into consideration what you have pointed out, that the coliform density at other times might vary from those tests, would your comments on that variation or the possible variation in coliform density in any way detract from the conclusions which these witnesses expressed?

A. In no way.

Q. Then I wanted to ask you one more thing. Oh, these variations, of course, might go up or down unless it so happened that the tests were made at a time where the witness could testify that it was either a maximum or minimum?

A. That is right.

Q. Does the Fairfax Drainage District have authority to deal with these sewage treatment problems?

A. Yes. The Fairfax Drainage District was set up under a special law tailored for this particular situation which gave it broad authority to do almost anything which a governmental agency can do. This includes the right to maintain sewers, to pump sewage, and to treat wastes.

CHAIRMAN WILSON: That is all.

MR. SAMSON: Let me ask a question.

Q. (By Mr. Samson) Is this Fairfax Industrial District a wholly-owned corporation? I mean by that is this a development that is primarily owned by the Union Pacific Railroad?

A. I don't know. My suggestion, Mr. Samson, is that these people will be on the stand tomorrow and the attorneys who worked this initial legislation through in 1920 will be here. You may want to ask them that question. I can't give you an authoritative answer.

Q. (By Chairman Wilson) Well, is it a corporation that is owned by any private individual? As I understood--

A. No, this is a public body.

Q. It is a governmental unit?

A. This is a governmental agency. It has governmental powers. I am sorry, I didn't get the question.

MR. STEIN: May I ask a question to clarify?

Q. (By Mr. Stein) The district named in the notice of the hearing issued by the Secretary of Health, Education and and Welfare is the Fairfax Drainage District of Kansas. As I understand it, that is a political subdivision under the laws of Kansas?

A. That is my understanding.

MR. STEIN: Now, the Fairfax Industrial District, while it may coincide with that, it may appear on the map and this may have been--off the record, this may have been our fault for using two different designations--may very well for other purposes be a private corporation. However, what we are referring to for this hearing in the notice of this hearing is the Fairfax Drainage District of Kansas, a political subdivision of that state.

MR. SAMSON: Well, Mr. Metzler, let me ask you this question.

Q. (By Mr. Samson) Who constitutes the officers or the trustees of this district?

A. They are elected annually, as I understand it.

Q. By whom?

A. By the members of the district.

Q. Of the district?

A. Of the district.

Q. Who are the members of the district?

A. Who are the members of the district? I am awfully sorry, but you are just out beyond my department. I don't know.

MR. BRENNEISEN: The owners of the property in the district. I think there are--

MR. SAMSON: Are there various owners of the property in the district?

MR. BRENNEISEN: Yes. I think the district has a population of less than 5,000 people, but I think it is the only district I know of in the State of Kansas where the electors are non-residents or can be non-residents. I don't know of any other district like that.

MR. JOHNSON: Wasn't this to be clarified by attorneys tomorrow?

MR. SALOME: Yes, they will have a representative here tomorrow to answer all these questions.

MR. SAMSON: All right, then, thank you very much.

CHAIRMAN WILSON: No further questions?

MR. JOHNSON: Mr. Chairman, I want to ask him another question.

CHAIRMAN WILSON: Okay, Mr. Johnson wants to ask you a question.

Q. (By Mr. Johnson) For purposes of clarification, Mr. Metzler, I think Mr. Koenigsdorf said to you a moment ago are you aware of the new pay-as-you-go plan. I am referring again to this statement down here that "Neither is the pay-as-you-go plan acceptable because of the delays this plan entails." That is in your statement.

A. Yes.

Q. And then Mr. Koenigsdorf asked you if you were aware of the new pay-as-you-go plan. Am I right?

A. My recollection is--

MR. KOENIGSDORF: It is the only pay-as-you-go plan.

A. My recollection is he asked me if I was aware of the pay-as-you-go plan.

Q. (By Mr. Johnson) I see.

A. And my yes was conditioned upon the plan which was submitted at the last hearing that Kansas City, Missouri, had before the Missouri Water Pollution Control Board at which it set out a series of dates from 1962 until 1966.

Q. That is the point I am trying to clarify, Mr. Metzler.

A. All right.

MR. JOHNSON: And that is the plan you had in mind, Mr. Koenigsdorf?

MR. KOENIGSDORF: Except '61, I think, is the date, '61.

MR. JOHNSON: May we disregard the dates? It is that plan?

MR. KOENIGSDORF: That is correct.

MR. JOHNSON: And we are agreed on that?

Q. (By Mr. Johnson) And is that still not acceptable to you?

A. It seems to me that this is not acceptable.

MR. JOHNSON: That is the point I want to make. Thank you.

A. I should say this is not acceptable, may I reword that.

MR. JOHNSON: Thank you.

CHAIRMAN WILSON: Everyone through with Mr. Metzler now?

MR. SAMSON: I have a question or two here yet.

Q. (By Mr. Samson) If you will look at Exhibit 14 and refer to the outlets or the outfalls F-11 to F--well, I will withdraw that. Referring to the outfalls F--well, yes, beginning from F-2 there at the bend back over to the left to F-18--do you follow me?

A. Yes, sir.

Q. Have you noted the nature of the material coming out of those outfalls personally or are you personally acquainted with the nature of the--

A. I have seen all of these outfalls. I have not collected samples nor submitted samples to the laboratory for analytical data on most of these.

Q. Would you give the Board the benefit of what you have observed and when you observed it?

A. Now you want this done outfall by outfall?

Q. No, just generally.

A. Well, this in general is industrial waste not greatly different in appearance from municipal sewage excepting lacking the fecal material, the concentration of fecal material would not be as high in this waste. Now, the exception to this would be the three outlets F-9, F-10 and F-11 from Phillips Petroleum Company and this is a relatively hot waste, temperatures--

Q. Of course you are out of the drainage district with those, aren't you?

A. I didn't think so, but--

Q. F-9 and F-10 are out of the drainage district. But I believe F-11 is in the drainage district. Well, go ahead, Mr. Metzler.

A. Well, if F-9--I am familiar with three waste outlets from Phillips Refinery and so far as I can tell these are F-9, 10 and 11. These outlets have a typical refinery waste, relatively warm, some oil, some of the sulphur--you can still smell some of the sulphur compounds. This is primarily an oily waste with considerable oil emulsions in it.

Q. Now, for the most part those outlets that you have referred to there at the north side of the bend, that is F-15 to F-18--

A. Yes.

Q. --are upstream from the Kansas City water treatment intake plant, isn't that right?

A. I am not positive from looking at this exactly where the Kansas City water intake is.

Q. Is that located at N-1?

A. I don't know.

CHAIRMAN WILSON: Well, I think there is no question about that. That has been testified by several witnesses. N-1 indicates--

A. This isn't what it shows here.

CHAIRMAN WILSON: --an outfall, a sewer or drain--

A. N-1 shows on the code here as a 54-inch--

CHAIRMAN WILSON: --at or near the Kansas City Water Plant.

A. I see. Okay.

CHAIRMAN WILSON: It doesn't indicate the intake of the water plant. It indicates a sewer or drain in that locality.

A. Well, I know that the intake is in that general are, yes. I am sorry, I just--

CHAIRMAN WILSON: So that these other outfalls on the Kansas side of the river to which Mr. Samson has referred are above the water plant.

A. Yes. Yes.

Q. (By Mr. Samson) Well, would the pollution that would come out of those outfalls, thatis from F-11 on over to F-18, be such as to endanger the health and welfare of citizens of Missouri, in your opinion?

MR. JOHNSON: F-15 to where, John?

MR. SAMSON: F-18.

MR. JOHNSON: 18.

MR. SAMSON: F-15 to F-18.

MR. JOHNSON: Yes.

Q. (By Mr. Samson) If you have any opinion on it.

A. Yes. Now, may I explain my answer?

Q. Yes.

A. I think on--

Q. You are answering yes?

A. You asked if it would have any effect and my answer to you is yes.

Q. Very well.

A. I think that this would be yes under certain conditions which I would like to explain.

Q. You may go ahead.

A. You get, especially at times of ice jam, some backing up of the river here. Ordinarily I think this waste will hug the Kansas bank of the stream and under ordinary conditions I doubt that it gets into Missouri intake, but at times when there is ice in the river and there are ice jams, artificial pooling, I think there is every evidence that it probably gets over there.

Q. And it would involve the--

A. And would involve the Kansas City, Missouri, water works intake.

Q. And that would be the people in Kansas City, Missouri?

A. Exactly. I think this constitutes interstate pollution in a pretty short reach of the stream.

MR. SAMSON: I have no further questions.

MR. JOHNSON: Could I ask a question, Mr. Chairman?

CHAIRMAN WILSON: All right.

Q. (By Mr. Johnson) Now, in connection with John's question which you have just answered--

A. Yes.

Q. --and you have said that that is in the period when there is ice, and so on and so forth, would you estimate in a percentage figure what portion of the year that might be, how many weeks or days or months?

A. I would think this is a very small percentage, Mr. Johnson. It might actually not occur at all in some winters and it might only occur a day or two a year otherwise.

Q. That is the point I am trying to make.

A. That is correct.

Q. At any time it would be quite small?

A. That is right.

MR. STEIN: May we ask you just one more question?

CROSS-EXAMINATION

BY MR. STEIN:

Q. Mr. Metzler, I would like to refer your attention to outlets C-15 to C-20, inclusive, on Government Exhibit No. 18. I don't know whether you were here during Mr. Clare's testimony, but Mr. Clare testified that these sewers serve both Kansas and part of Missouri and in the aggregate, taking them all together, about half the wastes came from Kansas and half from Missouri. Now, he also computed these wastes for us and the Missouri contribution was .8 million gallons a day suspended solids population equivalent of 7,100 and a BOD population equivalent of 3,425. These figures I gave you come from Missouri. Assuming these figures are correct and these wastes were discharged untreated through these pipes into the river, would you consider the addition of these wastes detrimental to the Kansas River and to Kansas?

A. I do. I think that in this case we are talking about increments of pollution, some of them large, some of them small, all of them which add up to a very alarming total. And it seems to me that whether it is 7,000 or 700,000 coming out of a sewer, that this is contributing to the problem in the Kansas River.

MR. STEIN: Thank you.

CHAIRMAN WILSON: Any further question?

(Witness excused)

CHAIRMAN WILSON: We will take a recess for five minutes flat.

(RECESS)

CHAIRMAN WILSON: The hearing will come to order.

We started just a few minutes after 7 o'clock and it is now a little after 8:30, so I think we will plan to quit in just about 30 minutes. Counsel whould make note of that and try to make the best use of that time possible.

MR. STEIN: Mr. Jack Smith.

MR. JACK SMITH: Yes, sir.

MR. STEIN: Mr. Jack Smith is Executive Secretary of the Missouri Water Pollution Control Board, also a representative of a party in this case, and we, as with Mr. Metzler, ask permission for Mr. Smith to read a statement in the interest of saving time.

CHAIRMAN WILSON: You may proceed, Mr. Smith.

JACK K. SMITH,

called as a witness on behalf of the State of Missouri, being first duly sworn, testified as follows:

DIRECT TESTIMONY

THE WITNESS: Activities of Division of Health and Water Pollution--

CHAIRMAN WILSON: May I ask you, is that like Mr. Metzler, you are reading from a prepared statement?

THE WITNESS: Yes, sir.

CHAIRMAN WILSON: And will you leave a copy with the reporter?

THE WITNESS: Yes, sir.

CHAIRMAN WILSON: So that she can use her own judgment about whether she wants to take it verbatim. If you depart from the statement, please indicate to her.

THE WITNESS: Yes, sir.

Activities of Division of Health and Water Pollution Board relative to Kansas City pollution of Missouri River, June 10, 1960.

1. May 13, 1953 - A copy of the Lower Missouri River Basin report of October 1952 was sent to city officials. This report outlined in detail the magnitude and sources of pollution in the Lower Missouri River. This report also pointed out the need for sewage and industrial waste treatment prior to discharge into the Missouri River.

2. December 22, 1953 - The city officials were advised of a uniform abatement program by the states of Iowa, Kansas, Missouri, Nebraska, South Dakota, Minnesota, and the Public Health Service. The objectives of the program and the necessity of providing primary treatment of sewage and industrial waste were explained.

3. January 4, 1955 - City officials were advised that they were to complete preliminary plans, cost estimates and arrangements for financing sewage treatment works by January 1, 1957. Contracts for construction of treatment works were to be awarded by January 1, 1959.

4. May 25, 1955 - City officials were taken on boat trip of the Kaw and Missouri Rivers to observe adverse visual effects of the Kansas City pollution caused by discharging raw untreated waste into the rivers.

5. November 8, 1957 - City officials were advised of Surgeon General's conference in accordance with Public Law 660 to be held in Kansas City December 3, 1957. City officials were requested to attend and present a statement outlining their plans for reduction of pollution in the Missouri River.

6. December 3, 1957 - Surgeon General's conference was held in Kansas City. City officials admitted pollution of the Missouri River and presented plans for abatement. The conferees agreed that necessary financial arrangements for financing the necessary sewage works be accomplished not later than September 1, 1959. First construction contracts for treatment works were to be awarded by January 1, 1960. The balance of construction contracts for treatment works to be awarded by March 1, 1960. The conferees strongly urged that the city officials call a bond election prior to January 1, 1959.

7. April 24, 1958 - The city officials were requested to submit engineering report and cost estimate for sewage works since the report was due March 1, 1958.

8. May 22, 1958 - City officials were advised of Water Pollution Board approval of the engineering report for sewage works.

9. November 14, 1958 - Albert W. Happy, Jr., and Jack K. Smith met with the mayor and city council, and explained the Missouri Water Pollution Law and Regulations (The Regulations became effective October 1, 1958.). City officials were advised that operating permits for existing sewers would be issued to Kansas City on the basis that the schedule for abatement works adopted at the Surgeon General's conference on December 3, 1957, would be adhered to.

10. December 12, 1958 - City officials were advised by letter of the operation of the Water Pollution Law and Regulations. Information was requested concerning the city's acceptance of the alternates set forth in the engineering report. No reply was received.

11. January 20, 1959 - City officials were advised of the dates adopted at the conference which called for financial arrangements to be completed by September 1, 1959, and construction contracts to be awarded by January 1, 1960, and March 1, 1960.

12. February 24, 1959 - The Executive Secretary of the Water Pollution Board and a representative of the Public Health Service met with the mayor, city manager, director of public works, and viewed the movie entitled "Problems of Progress". The city manager stated that a comparable film could be developed for Kansas City to be used in promoting a bond issue for pollution abatement works.

13. April 3, 1959 - Operating permits were issued to Kansas City with the understanding that dates adopted at the conference be adhered to.

This is not in the record and I would like to point out that these operating permits were for outlets draining into the Missouri River and to the Blue River.

14. April 17, 1959 - A conference with city officials was requested. No reply was received.

15. September 9, 1959 - The Water Pollution Board met and discussed the lack of progress in the pollution abatement program and the failure of city officials to answer correspondence regarding water pollution. As a result, a resolution was adopted instructing the Executive Secretary to withdraw approval of the Kansas City sewage disposal facilities.

16. September 10, 1959 - A copy of the Board's resolution was sent to the city officials and to the Veterans Administration and to the Federal Housing Administration regional offices in Kansas City. The Kansas City officials were at the same time advised of the Board's intention to revoke existing operating permits by October 15, 1959. No reply to this letter has been received.

17. On January 8, 1960, the Executive Secretary requested a second Surgeon General's conference regarding pollution of the Missouri River in the Kansas City area.

18. February 18, 1960 - City officials of Kansas City were advised that the Water Pollution Board would not issue a construction permit to Eaton Realty Company for construction of a sanitary sewer.

19. March 15, 1960 - The mayor of Kansas City was advised that the Water Pollution Board would at the March 22, 1960, Board meeting consider possible legal action against Kansas City because of failure to meet the time schedule adopted at the Surgeon General's conference on December 3, 1957. The mayor or a representative was invited to attend the Board meeting.

20. March 22, 1960 - Councilman Charles Shafer, City Counselor Richard Koenigsdorf, and City Engineer Stanley Palmer met with the Water Pollution Board. Mr. Shafer speaking on behalf of the city council stated that on the preceding day they had received copies of a report by the Public Health Service based on pollution studies of the Missouri River during December 1959 and January 1960. Mr. Shafer stated that the city council had not had an opportunity to discuss the pollution problem and, therefore, they were not in a position at this time to offer a time schedule for pollution abatement. Mr. Shafer on behalf of the city council extended an invitation to the Water Pollution Board to come to Kansas City and meet with the council at an early date.

Mr. Koenigsdorf asked that restrictions involving issuance of construction permits for sewer construction be lifted for a period of 90 to 120 days to give the council an opportunity to come up with a plan; if the plan was not acceptable or if the council failed to submit a plan, then the Board could re-establish the restrictions. Mr. Koenigsdorf felt that lifting the restrictions would create a better atmosphere for cooperation with the city officials. The Board accepted Mr. Shafer's invitation and selected a committee of three and the Executive Secretary to meet with Kansas City officials at an early date.

The Board did not lift restrictions on issuance of construction permits for sewer construction. The Board extended an invitation to Kansas City officials to meet with the Board at its next regular meeting on May 3, 1960.

21. March 23, 1960 - The mayor was advised of the Board's acceptance of Councilman Shafer's invitation and since Mr. Shafer had suggested an early date, the mayor was advised that the dates of March 25 or April 1 were satisfactory with the committee.

22. March 24, 1960 - The Water Pollution Board requested the Public Health Service to proceed with the hearing at Kansas City rather than the conference as requested on January 8, 1960.

23. March 24, 1960 - Mayor H. Roe Bartle's secretary called the Executive Secretary and invited the committee to attend the city council meeting on March 25, 1960.

24. March 25, 1960 - The committee and the Executive Secretary met with the city council in Kansas City and made a brief statement as follows:

"The Missouri Water Pollution Board has reviewed survey data regarding water quality of the Missouri River below Kansas City, Missouri, and has concluded that pollution does exist and that Kansas City, Missouri, is responsible for the major portion of the pollution. For November 1959 the monthly average coliform mpn at the Boonville water intake, 406,478, was over seven times that at the Kansas City, Kansas, water intake, 58,400. This was during a period of navigation flows, over 40,000 cfs. For December 1959 the monthly average coliform mpn at the Booville water intake, 247,519, was 6.5 times that at the Kansas City, Kansas, water intake, 38,846. This was a period when river flows were less than 20,000 cfs.

"Kansas City's official statement at the conference called by the Surgeon General December 3, 1957, was that the city fully recognized the pollution problem and that the 'discharge from our municipal sewers and direct discharges by industries results in a degree of contamination within the Kansas City reach far in excess of any conceivable limit of tolerance'.

"Target dates for the abatement of pollution were given by the city at the conference. The conferees accepted these dates. The date of March 1, 1959, was given for acceptance or revision of the engineering report. This date has been violated. September 1, 1959, was the date by which financing of the project was to be provided. This date has been violated.

"The Water Pollution Board seeks information regarding the intention of Kansas City, Missouri, as to what will be done to abate pollution and when it will be done."

Following the meeting with the Committee the city council introduced Ordinance No. 24907 and referred same to the Public Improvements Committee with a public hearing to be held March 31, 1960. This ordinance grants permission to the Eaton Realty Company to construct 1,100 feet of eight-inch sanitary sewer to serve a five-acre tract of land near 87th Avenue and Brooklyn Avenue. The Water Pollution Board had previously advised the Eaton Realty Company that the Board would not issue a construction permit for this proposed extension in line with the Board's resolution of September 9, 1959.

25. March 30, 1960 - Mr. Richard Koenigsdorf, City Counselor, was furnished a copy of our letter to Governor James T. Blair, Jr., together with a summary of the action of the Water Pollution Board and the Division of Health relating to pollution abatement at Kansas City.

26. April 11, 1960 - The mayor and city council were advised that recent studies by the Public Health Service and the Water Pollution Board definitely established the fact that the Missouri River is unreasonably polluted below Kansas City and that this pollution adversely affects the water supplies at Lexington, Glasgow, Boonville, Jefferson City, and St. Louis. Pollution from Kansas City, Missouri, can be identified in the Mississippi River as far downstream as Chester, Illinois. The officials were again advised that due to excessive pollution in the river and the city's failure to maintain the schedule adopted on December 3, 1957, the Board had on September 9, 1959, passed a resolution prohibiting

issuance of further construction permits for sewer construction which would result in the discharge of additional raw sewage into the Blue or Missouri Rivers. The city officials were again advised that the Water Pollution Board had on February 18 informed the Eaton Realty Company that the Board would not issue a construction permit for the proposed 1,100 feet of eight-inch sanitary sewer. The city officials were requested to review the provisions of the Water Pollution Law prior to passage of Ordinance 24907.

27. April 27, 1960 - The mayor and city council were advised that Ordinance 24983 which had been recently introduced and which provided for construction of eight-inch sanitary sewers to serve a 25-acre tract in Sherwood Estates, Kansas City, Missouri, would cause the Board to consider possible legal action.

28. April 27, 1960 - Notice of and an invitation to attend the Water Pollution Board meeting on May 3, 1960, was sent to the mayor and city council of Kansas City.

29. May 3, 1960 - Mr. Koenigsdorf, City Counselor, Kansas City, appeared before the Water Pollution Board, and stated that the city council had not had time to formulate a plan because of other problems facing the city. Mr. Koenigsdorf requested that the Board grant Kansas City until June 1, 1960, to present a plan for pollution abatement. The Board granted the request.

30. May 13, 1960 - The mayor and city council were advised that the Board had granted their request for extension until June 1, 1960, for submission of a pollution abatement plan. The Board requested that the plan include:

One. Date for bond election to finance pollution abatement works or the date that an alternate plan for financing will be effective.

Two. Assuming the the bond election carries or other means of financing are arranged, the date that detailed plans and specifications will be submitted to the Water Pollution Board.

Three. The date for start of construction of sewage treatment works.

Four. The date for completion and placing sewage treatment works in operation.

31. June 1, 1960 - Councilman Charles Shafer and City Counselor Richard Koenigsdorf appeared before the Water Pollution Board and presented a plan for pollution abatement. In brief, the plan is as follows:

"Resolution 25110, adopted by the city, provides that the council will submit to the citizens of Kansas City on November 8, 1960, a general obligation bond issue of $20,000,000 primarily for the construction of trunk sewers; if the bond issue is passed the city council will:

a. By December 1, 1960, enact an ordinance instituting the pollution abatement charge.

b. By December 1, 1961, complete engineering detail and submit to the Missouri Water Pollution Board the plans for the sewage treatment plant for the Turkey Creek-Santa Fe Sewer outfall along with Broadway Sewer interceptor.

c. By March 1, 1962, award contract for construction of "b" above.

d. By March 1, 1963, facilities in "b" above to be in operation.

e. By July 1, 1964, complete engineering detail and submit to the Missouri Water Pollution Board the plans for the sewage treatment plant for the Blue River outfall.

f. By December 1, 1964, award contract for the construction of "e" above.

g. By December 1, 1965, facilities in "f" above are to be in operation.

h. By January 1, 1966, complete engineering details and submit to the Missouri Water Pollution Board the plans for necessary sewage treatment of remaining outfalls.

i. By December 31, 1966, award contracts for construction and have in operation the facilities set out in "h" above."

Mr. Shafer asked the Water Pollution Board to immediately lift the restrictions regarding construction of sanitary sewers. Based on the plan submitted and the request of Mr. Shafer, the following resolution was adopted by the Board:

"Water Pollution Board Resolution, June 1, 1960.

"WHEREAS, the City Council of Kansas City, Missouri, has adopted Resolution No. 25110 on May 27, 1960, which resolution was presented to the Water Pollution Board at a special meeting on June 1, 1960, with the request by City Councilman Charles Shafer that the Water Pollution Board remove existing restrictions it has placed on sewer extensions in Kansas City; and

"WHEREAS, according to a statement of City Counselor Richard Koenigsdorf before the Water Pollution Board on June 1, 1960, the City Council has the legal authority to make a pollution abatement charge for establishing construction of sewage treatment facilities; and

"WHEREAS, similar restrictions regarding sewer extensions exist in other Missouri cities pending financing of programs for pollution abatement;

"NOW, THEREFORE, BE IT RESOLVED that:

"1. Because it is the opinion of this Board that the implementation of the plan presented will abate pollution of the Missouri River, that no further action be taken at this time; and

"2. That previously imposed sewer extension restrictions will be removed at such time as the proposed "pay-as-you-go" or other effective plan for financing pollution abatement works in accordance with the schedule contained in Resolution 25110 has been placed in full force and effect."

32. June 2, 1960 - The Board resolution of June 1, 1960, was forwarded to the mayor and members of the city council.

33. June 3, 1960 - The Kansas City city council passed Ordinances No. 24907, the Eaton Sewer, and No. 24983, the Stanton Sewer.

That concludes my statement.

CHAIRMAN WILSON: Any questions, counsel?

MR. STEIN: Yes.

CROSS-EXAMINATION

BY MR. STEIN:

Q. Mr. Smith, does the Missouri Water Pollution Control Board have any jurisdiction over wastes discharged from the Turkey Creek Sewer?

A. No, they do no.

CHAIRMAN WILSON: Any jurisdiction of what?

MR. STEIN: Over wastes discharged from the Turkey Creek Sewer.

MR. KOENIGSDORF: Object to that as calling for a conclusion of law from a witness who has not been qualified to answer.

Q. (By Mr. Stein) Do you exercise any such jurisdiction?

A. No, we have not.

Q. Would you consider you would have to give a permit for that?

A. We did not. We gave operating permits for other sewer outlets, but not that one.

Q. Why didn't you give it for that one?

A. We didn't think we had jurisdiction.

Q. Do you intend to use legal action to enforce abatement of wastes in the Turkey Creek Sewer?

A. No, not to my knowledge.

Q. Why not?

A. It is my opinion we don't have--

MR. KOENIGSDORF: I object to that, if you please, as calling for something without the knowledge of this witness. It would be up to the attorney general to decide that sort of thing. He doesn't know the legal implications of these things and I object unless it is shown he is qualified to answer that question.

CHAIRMAN WILSON: The answer may stand subject to the objection. The Board will, of course, take into consideration the fact that as far as legal authority is concerned that is entirely a matter of law, so that this witness's answer will be considered only as extending to the limits of his knowledge and subject to correction as to any lack of knowledge on his part about the terms of the applicable statute.

Q. (By Mr. Stein) As I read this, do I understand that the twenty million dollar trunk sewer--if construction is taken in accordance with their bond issue, if it is successful, will that abate any pollution?

A. No.

Q. It will not?

A. No.

Q. As I understand it, subsequent to the resolution passed on June 1, 1960, by the Missouri Water Pollution Control Board where you said you would not lift the restriction for new waste discharges and issue permits for new sewer extensions, the city council of Kansas City did, in fact, pass an ordinance authorizing additional sewer extensions?

A. That is correct.

Q. Now, if these go into effect this will add to the already existing load of the river in the Kansas Cities area?

A. Yes.

MR. STEIN: No further questions.

CHAIRMAN WILSON: Any questions, counsel?

MR. KOENIGSDORF: Yes, sir, I have several. Shall I start on them?

MR. JOHNSON: I do too.

CHAIRMAN WILSON: Your cross-examination, I assume, will take some time, then?

MR. KOENIGSDORF: It will probably take a little longer than the two minutes that remains before 9:05.

CHAIRMAN WILSON: Well, I think we may as well--

MR. SALOME: Let's don't adjourn. Let's carry it on a little further, 15 or 20 minutes here.

CHAIRMAN WILSON: I think that in pursuance of the understanding already had among the members of the Board generally and with counsel that the time has arrived when we will have to terminate this evening's session, unless the members of the Board decide otherwise. How do the members feel about it?

(Off the record)

CHAIRMAN WILSON: I am very skeptical about how soon counsel might terminate the cross-examination of a witness of this kind. I am afraid that if we continue here we will find ourselves dragging out until late in the evening. We have already saved quite a little time by this.

MR. POOLE: I move we recess until morning, Mr. Chairman, 9 o'clock in the morning.

MR. SAMSON: That is all right.

MR. SALOME: I am in the minority.

MR. RIDGE: We are in the minority. We say go ahead.

MR. SALOME: We say go ahead.

MR. JOHNSON: But you are still in the minority.

MR. SALOME: We know it.

CHAIRMAN WILSON: We will take a recess until 9 o'clock tomorrow morning.

- - -

WHEREUPON, the hearing was adjourned until 9 o'clock a.m. of the following day, at which time the following further proceedings were had and entered of record, to-wit:

- - -

MORNING SESSION, THURSDAY, JUNE 16, 1960

CHAIRMAN WILSON: The hearing will come to order.

We have Mr. Smith on the stand again, Mr. Stein. Were you through with him?

MR. STEIN: Well, we just have one more question.

JACK K. SMITH,

resumed the stand and testified further as follows:

CROSS-EXAMINATION (Continued)

BY MR. STEIN:

Q. Mr. Smith, can you give us the progress of other Missouri cities in providing waste treatment facilities?

A. Yes.

Kansas City Assembly Plant, Ford Motor Company, Claycomo, Missouri.

Wastes from the assembly plant are segregated into three categories:

1. Sanitary wastes are collected in a separate sewer and are discharged to an activated sludge plant for complete treatment. The effluent from this plant is satisfactory.

2. Industrial wastes are collected in a separate sewer and are discharged to an appropriate industrial waste treatment plant. The effluent from this plant is satisfactory.

3. Storm wastes are collected in three separate storm sewers and are discharged to the receiving stream through the west outfall and the southeast and northeast outfalls. The southeast and northeast outfalls discharge a small quantity of rinse water from a bonderizing process plus a large quantity of cooling water. The effluent from these outfalls appears to be satisfactory.

Liberty, Missouri. Preliminary report was submitted by Haskins, Riddle and Sharp and was approved January 30, 1958. Revisions to the report are under discussion now:

In a letter dated July 16, 1959, to the Clay County Health Department from the Executive Secretary of the Water Pollution Board, the health department was advised to obtain dates for Liberty for the following:

1. Bond Election;

2. Submission of detailed plans and specifications;

3. Start of construction;

4. Completion of project.

On July 12, 1959, the Clay County Health Department advised the City of Liberty to submit a commitment to the Water Pollution Board regarding dates for the above improvement schedule.

Note in file that bond election was set for November 3, 1959.

Letter from the city to Water Pollution Board on October 12, 1959, asked for postponement from November 3 to March 1960. March 1960 accepted.

Because of school bond election set for same date in March, the city did not hold election. On April 20, 1960, the Water Pollution Board asked if a definite election date had been set, if a tentative election date had been set, if an educational plan had been proposed.

John F. Schondelmeyer, representative of the Water Pollution Board, attended city council meeting May 6, 1960, and was informed that a citizens' committee of 25 members had been appointed to make recommendations to the council as to the type of treatment plant, method of financing, and date of bond election, and to set up educational and promotional plan. This group was instructed by the mayor to hold meetings and to report to the council on June 3.

On June 3 before council meeting, the citizens' committee had submitted a tentative date in September. Committee had other meetings scheduled with the engineer, et cetera, before setting definite date but would be in September or before.

Lexington, Missouri. I am going to summarize this now instead of giving what is in this report, to say that the city has employed consulting engineers; the engineering report is due in our office by June 15th. We have word from the engineers that plans and specifications will be available to the Board six months after a notice to proceed by the city or arrangement of financing. And construction of treatment works would require approximately 12 months.

Waverly, Missouri. A small community of about 600 people. They have no treatment, they have taken no steps, but they have been advised that a consulting engineer should be hired to make a study of the present sewage system and to include recommendations for treatment.

Boonville, Missouri. A preliminary engineering report for interceptor sewers, lift stations and primary treatment for Boonville was approved November 25, 1959, by the Water Pollution Board. No action has been taken by the city for holding the bond election for financing the proposed improvements. City officials and civic leaders of Boonville believe a bond election will be successful if Kansas City has taken steps to abate pollution in the Missouri River.

Jefferson City. Preliminary engineering report for primary sewage treatment for Jefferson City was approved August 30, 1957, by the Water

Pollution Board. The mayor and city council of Jefferson City are studying various methods of financing the proposed project.

Washington, Missouri. The city officials of Washington have selected a firm of engineers to make the preliminary engineering study, but as yet have not entered into a contract with the engineers. City officials are aware of the problem, but are slow to take any positive action until Kansas City has taken definite steps to abate pollution there.

St. Charles, Missouri. St. Charles is at the present time constructing a 30-acre waste stabilization lagoon which will serve 4,000 persons who are now served by sewers discharging into the Missouri River. In addition, this waste stabilization lagoon will serve subdivisions now under construction which will have a population of 2,000. The city owns another 70 acres on which to expand the present waste stabilization lagoon. No new subdivisions will be built unless sewage treatment facilities are provided. Progress in providing sewage treatment for the entire city has been slowed down to see what Kansas City does about their sewage treatment.

Coldwater Creek in the metropolitan sewer district, St. Louis. The engineering report for this area of the metropolitan sewer district was approved May 1956. The metropolitan sewer district will hold a bond election to finance these improvements prior to September 1, 1960.

Independence, Missouri. Bonds were voted for sewage treatment November 1958. Construction of outfall to plant site at this time is approximately 50 percent complete. The outfall would have been completed at this time except for construction industry strike. It is now proposed to award contracts and start construction of the primary treatment plant not later than November 1, 1960. The plant to be completed and placed in operation November 1, 1961.

Sugar Creek, Missouri. Arrangements have been made with the City of Independence for a joint treatment plant. The schedule for start of construction and completion are, therefore, the same as for the City of Independence.

Standard Oil Refinery--

MR. SAMSON: Jack, would you go back? Sugar Creek, that is right at the outskirts of Kansas City, Missouri, isn't it?

THE WITNESS: Yes, and immediately adjacent.

MR. SAMSON: What was the schedule on Independence, Missouri?

THE WITNESS: Independence, Missouri, start construction November 1, 1960, completed and placed in operation November 1, 1961.

MR. SAMSON: I didn't quite follow you, but you have got a definite commitment, then, from Independence to go ahead with their treatment plant, is that right?

THE WITNESS: Oh, yes.

MR. SAMSON: And the Sugar Creek situation is in exactly the same situation?

THE WITNESS: That is correct, they are going together.

MR. SAMSON: Thank you. I am sorry to interrupt you.

THE WITNESS: Standard Oil Refinery, Sugar Creek. Waste caustic neutralization facilities are now under construction and completion is anticipated by September 1, 1960. Foul water stripping facilities have reached final design stage. Construction will start January 1961. Completion of the work is anticipated late in 1961. The waste stabilization lagoon is nearing final design and will be completed as soon as details of proposed dike construction can be cleared with the Corps of Engineers. Completion of the lagoon is anticipated not later than March 1, 1962. A nine-month strike at Standard Oil has delayed completion of pollution abatement works.

North Kansas City, Missouri. Engineering report was approved January 8, 1958. The city has agreed to the following time schedule:

1. Bond election for sewage treatment plant and interceptor sewers by September 1, 1960.

2. Plans and specifications for sewage treatment plant to be submitted to the Water Pollution Board by April 1, 1961.

3. Construction contract award by July 1, 1961.

4. Construction completed and sewage treatment plant to be placed in operation by December 1, 1962.

On June 9, 1960, North Kansas City made application for federal grants for proposed interceptors and treatment plant. The mayor has assured the Water Pollution Board that he and the city council are unanimously agreed in their desire to pursue the pollution abatement program to a successful conclusion.

In addition I will say that we have resolutions from the North Kansas City council verifying these statements and time schedules.

That concludes my statement.

MR. STEIN: We have no further questions.

CHAIRMAN WILSON: Has counsel any cross-examination?

MR. KOENIGSDROF: If you please, sir.

CROSS-EXAMINATION

BY MR. KOENIGSDORF:

Q. Mr. Smith, do you mean to tell me that you did all those things without the Kansas State Board of Health helping you on them?

A. Yes, sir.

Q. I will ask you, sir, if Kansas City has done anything in regard to engineering studies on the question of sewage treatment?

A. Yes, sir.

Q. To what extent, sir?

A. The preliminary engineering reports have been made and have been approved. I believe we gave it--

Q. Approved by the Missouri State Board, is that right?

A. That is correct.

Q. Now, sir, I will ask you if you know Ed Mockobey?

A. Yes, sir.

Q. Do you know who he is and what his job is?

A. Yes, sir.

Q. Would you tell the Commission, please?

A. Mr. Mockobey is a chemical engineer employed by the City of Kansas City to work with industry in reducing pollution by improved housekeeping methods, and so forth, to reduce the load on the sewage treatment plant when built and thereby, of course, reduce the pollution to the Missouri and Blue Rivers.

Q. Do you know that he devotes his full time to this particular project that you are discussing?

A. That is my understanding, yes, sir.

Q. Do you find him to be a capable and aggressive individual in that particular field?

A. Yes, certainly.

Q. Is it usual or unusual that a city has such an individual hired for taking care of problems connected with industrial pollution?

A. I would say it is unusual that this is done ahead of treatment. Maybe other cities would do it after they have got treatment, but I say it is unusual in that this is done prior to treatment.

Q. Just as a matter of record and to describe somewhat the atmosphere and the problems that the State Board and the city have had between each other, are you familiar with the fact that there was an election in Kansas City, Missouri, approximately a year ago?

A. Yes.

Q. And in which there was a substantial change in the administration and the city government?

A. Yes.

Q. After that election there was a period in which in your statement you have advised this Commission that there was a lack of correspondence and communication between the department and the city, is that correct?

A. That is correct.

Q. After March, which I think is the first time that I know of that the Board and representatives of the city got together--is that your recollection, March of 1960? Wasn't that the first meeting?

A. March 22.

Q. From that time until the present would you advise the Commission if you think there has been a substantial improvement of the relationship between the Board and the City of Kansas City, Missouri?

A. I would say that that is demonstrated by the fact that a plan has been developed.

Q. You mentioned that plan and you referred to it in your notes. I wonder if you would happen to have a copy of the resolution of the city council with you that was furnished to the Board from which you made these notes?

A. Yes, I do have.

Q. Do you hold it in your hand, sir?

A. Yes, sir.

MR. KOENIGSDORF: For the purpose of identification, would you mark this, please, as Kansas City Exhibit No. 1.

(Kansas City, Missouri, Exhibit No. 1 marked for identification.)

CHAIRMAN WILSON: Are you adopting some uniform system for distinguishing between the exhibits of the different parties? You are likely to get exhibits from the different industries too.

SECRETARY AYERS: No, I am not, Mr. Chairman. I an adopting this. I am marking this as Kansas City, Missouri, Exhibit No. 1. If you want it A, B, C or what-have-you, it seems to me more appropriate to go down 1, 2, 3 and identify the exhibit by the party that puts it in.

CHAIRMAN WILSON: That is probably as good a system as any in view of the number of different sets of exhibits that we are likely to have.

Very well, that is Kansas City Exhibit 1.

Q. (By Mr. Koenigsdorf) You have identified this, sir, as the copy of resolution No. 25110 adopted by the city council of Kansas City, Missouri. It has the authentication noted and a seal upon the form. This is from your official records and is the copy presented to you of this resolution, is that correct, sir?

A. That is correct.

Q. And it provides--it is headed "Providing a Combined Plant for Sewage Pollution Abatement Financed by Pay-As-You-Go Plan and Trunk Sewerage Financed by General Obligation Bonds"?

A. Yes.

MR. JOHNSON: I haven't seen it.

MR. KOENIGSDORF: Excuse me.

At this time, Mr. Chairman, Kansas City, Missouri, offers in evidence Kansas City, Missouri, Exhibit No. 1.

CHAIRMAN WILSON: Any objection?

MR. EDELMAN: No objection.

CHAIRMAN WILSON: Hearing none, it will be received.

(Kansas City, Missouri, Exhibit No. 1 received in evidence.)

Q. (By Mr. Koenigsdorf) Are you familiar with the contents of this resolution and the plan that is contained therein, Mr. Smith?

A. Yes.

Q. Are you aware, sir, that Kansas City, Missouri, has a need for trunk sewerage in connection with the expansion and development of the area in the present city limits?

A. Yes.

Q. Do you find in this plan a combined program, including some trunk sewerage plus sewage treatment?

A. Yes.

Q. I believe the amount indicated for the bond proposal under general obligation bonds for essentially trunk sewerage is twenty million dollars?

A. That is correct.

Q. Then the pay-as-you go plan is a plan to place upon the water bill a charge and from this charge to use the proceeds to construct sewage treatment, is that correct, sir?

A. That is right.

Q. Are you also familiar with the fact that this is tied together in that the resolution provides that the general obligation bonds will be submitted to the voters on November 8, 1960, and that by publicity and general educational methods it is the intention of the council to advise the voters that by adopting this plan they will also--by adopting the bonds they will also be tacitly approving the pay-as-you-go plan?

A. I don't know about the point of an educational campaign. I don't know whether that is contained in this, Mr. Koenigsdorf, or not.

Q. I don't think it is in the resolution, but I thought you were aware of that.

A. Well, I thought we were talking about the resolution.

Q. Well, we are talking about it and your knowledge about it at the same time, sir.

A. Well, that is correct, that a bond--this pay-as-you-go plan would be enacted if the bond issue carries.

Q. I don't know if you know this. There have been explanations made by counsel as we went along of certain technical points and you may or may not know that it was the opinion of the city counselor's office that the pay-as-you-go plan in and of itself could not be placed upon the ballot because that would be merely taking a straw vote of public sentiment, which is not authorized by our statutes or by our charter. And, therefore, the device was used of combining the two together in order to gain approval or disapproval of the voters of Kansas City as to the pay-as-you-go plan.

MR. SAMSON: Did you expect an answer from Smith to that? Was that in the nature of a question?

MR. KOENIGSDORF: If he knows, but I think probably that was more in my province to make a statement of clarification than to ask him unless--

Q. (By Mr. Koenigsdorf) Do you know of that, sir?

MR. KOENIGSDORF: Mr. Powers has a further statement on that.

MR. POWERS: Mr. Smith, are you aware that the charter of Kansas City provides no method by which an abstract proposition of shall we impose a pay-as-you-go plan or shan't we, there is no mechanics provided in the charter for submission of that question. There is a method provided by the state law for submitting a revenue bond proposition made out of special assessments or special what is ordinarily called sewer service charges. But that would impose a large amount of interest on the people and, for the purpose of accompoishing the same result without the payment of an amount of interest practically equivalent to the amount of the bonds, this pay-as-you-go plan was adopted. And the only way of submitting it to the people for their approval, which you would do in the case of revenue bonds, is to tie it to some proposition like this. Did you realize that that was the basis of this unusual kind of a resolution?

MR. STEIN: Mr. Chairman, we have no objection to the statement, but I would like to have one clarification. By whom was this pay-as-you-go plan adopted?

MR. POWERS: The city council.

MR. STEIN: You mean the city is in favor of a pay-as-you-go plan, has adopted it and agreed to put it into effect?

MR. KOENIGSDORF: No, I believe that you lost the point entirely.

MR. STEIN: I don't think I have lost the point. I am listening to the record.

MR. KOENIGSDORF: You have lost the point entirely, I believe, sir. The pay-as-you-go plan is a plan which has never been used in the State of Missouri, to my knowledge, under this particular type of an arrangement. It was proposed by the city engineer, Mr. Palmer, and the question of its validity was asked and the counselor's office found that it was a proper method of procedure. The council by reason of this finding by the law department could have instituted a charge of their own volition as of now, we will say. On an issue as large as this, and because of the need for trunk sewerage as well, the council felt that it was preferable to allow the matter to go to the people for a vote and, therefore, November 8 was selected as the time it would be placed upon the ballot for the vote, which would encompass by general education both plants, the trunk sewerage treatment and the sewerage treatment. Does that explain it?

MR. STEIN: That fully explains it. In other words, the pay-as-you-go plan has not been adopted. I can well understand. That clarifies it.

MR. KOENIGSDORF: We are doing the same thing other cities are doing in submitting the issues to the people, but in a combination. By so doing, if adopted it would save a considerable amount of interest for the people of Kansas City.

Q. (By Mr. Koenigsdorf) Now, this resolution does provide, sir--I believe you have covered it--that Turkey Creek Sewer outfall would have the treatment facilities constructed and in operation by March 1, 1963, is that correct?

A. That is correct.

Q. The contract would have been awarded by March 1, 1962?

A. Correct.

Q. And in the interim the necessary engineering would have been secured, of course we would have site requirements, and approval would have been requested and presumably worked out with the Missouri State Pollution Board prior to the date of the letting of the contract on March 1, 1962, right, sir? Is that correct?

A. Yes, that is correct.

Q. By the way, in this schedule the first unit to be completed is the Turkey Creek outfall?

A. That is correct.

Q. I noted in your statement that you read last night in paragraph 26--and I don't believe this has been marked as an exhibit; it was a statement which was read, it is not an exhibit--in paragraph 26 you have mentioned something about Chester, Illinois, and a matter of pollution. May I ask you, sir, if this information contained in paragraph 26 is from your own knowledge?

A. It is from--

Q. As to that particular item?

A. The basis of this knowledge is from a study made by the Public Health Service.

Q. You--

A. Which we joined in.

Q. You actually have no personal knowledge of this?

A. No. If you mean if I collected samples personally?

Q. Yes.

A. No.

Q. It is only what somebody told you had been done?

A. That is correct.

MR. KOENIGSDORF: I would ask, sir, that so much of the statement as was read and as is contained in paragraph 26 which is a statement pertaining to pollution in Chester, Illinois, be removed from the record.

CHAIRMAN WILSON: Well, it will be received subject to your objection and motion. The Board will take into consideration the circumstances in which the information was obtained and give it whatever weight we deem it entitled to.

Q. (By Mr. Koenigsdorf) It seems as though we have been explaining the attitude and the contact between the Missouri State Pollution Board and the City of Kansas City a little bit here this morning and I note that in your statement you also refer to the Eaton and Stanton ordinances which provide generally for the permission by Kansas City, Missouri, to these particular construction companies to hook into the Kansas City, Missouri, sewer system, is that correct?

A. That is correct.

Q. And I will ask you further, sir, if on June 1st when a member of the city council and I appeared before the Pollution Board and met with the Pollution Board we did not at that time very candidly advise the Board that it was the opinion of Kansas City, Missouri, that this matter of not issuing this permit was arbitrary and unreasonable in view of the attitude of the city of trying to work with the Pollution Board and that the city did not feel bound by it, is that correct? This came as a great surprise to you after the meeting that we had on June 1, is that correct?

A. I don't recall being bound by it, Mr. Koenigsdorf. I do know that you felt--expressed the feeling thqt this was arbitrary and high-handed on the part of the Board.

Q. Yes, sir. And further were you advised by the delegates from Kansas City that appeared that in view of the serious winter that was had in Kansas City, with people out of work for a long period, and in further consideration of the lengthy strike which has been and is still going on in Kansas City and the general economic picture in Kansas City that in the best interests of the people of Kansas City it was believed the council would feel that it was necessary to not allow anything to hinder construction work and put people out of jobs in our city?

A. That is correct.

MR. KOENIGSDORF: Thank you, sir.

MR. BRENNEISEN: No questions.

CHAIRMAN WILSON: Anyone else any questions?

MR. STEIN: Yes.

CHAIRMAN WILSON: Go ahead.

CROSS-EXAMINATION

BY MR. STEIN:

Q. With reference to this ordinance introduced as Kansas City, Missouri, Exhibit No. 1, the twenty million dollar proposed bond issue for trunk sewers, will that abate any pollution?

A. No.

Q. If it is constructed?

A. No.

Q. What kind of a bond issue will that be, do you know?

A. General obligation.

Q. What kind of vote is required in Missouri to pass a bond issue of that type?

A. Two-thirds.

Q. What would be the attitude of the city, as you understand it, if this bond issue fails toward the pay-as-you-go plan?

A. It would not be enacted.

Q. The pay-as-you-go plan would not be enacted. In other words, as you understand it, can the city council impose a pay-as-you-go plan without going to the voters?

A. Yes, that is my understanding.

Q. In other words, as I understand this ordinance and what you have said, a pay-as-you-go plan which could be enacted right now without going to the voters is going to be tied to a bond issue which will not decrease the pollution load but may increase it and this bond issue will have to be passed by a two-thirds vote, that is a kind of popularity contest?

A. That is right.

Q. Have you been familiar with bond elections in this field in the past in this country or not? If you are not--

A. You mean a bond election just for trunk sewers?

Q. No, just bond elections.

A. Oh, yes, I am familiar with bond elections in Missouri.

Q. Just Missouri?

A. Yes.

Q. Is it kind of difficult sometimes to get a two-thirds vote when there is opposition to a bond election?

A. Yes, I would say it is.

MR. STEIN: No further questions.

CROSS-EXAMINATION

BY MR. KOENIGSDORF:

Q. Are you inferring, sir, that it is not proper to submit to the voters an issue of a twenty million dollar expenditure, whatever it might be?

A. Are you asking me?

Q. Yes, sir.

A. I am not inferring that.

Q. You realize that this is a sizable expenditure--

A. Yes.

Q. --of the funds of the citizens of our city?

A. Yes.

Q. I will ask you further, sir, if when you say that the installation of trunk sewerage will not do anything to lessen pollution in the city you actually mean that? You mean pollution of the river?

A. Well, that is correct, that is what I am talking about, the river.

Q. Because certainly the septic tanks and other types of treatment or lack of treatment that exist in areas that are not trunk sewered are matters of pollution concern, are they not, sir?

A. I think, if I may say here, that as I understand this proposal to build trunk sewers, it would eliminate some small temporary sewage treatment plants that are now in use and basically that is a good plan. But you ask about pollution abatement. That is going to increase it, as a matter of fact, at the Missouri River. It is going to get rid of a local situation, but it is going to transfer the sewage without treatment to the Missouri River or Blue River, whichever the case may be.

Q. But when you mention pollution and sewage you have to take it in all phases, do you not? You can't just worry about where it goes in the river; we can't have part of it out on the ground in one area and the other go in the river treated?

A. Oh, no. I am not discouraging trunk sewers at all.

Q. That is what I am wondering.

A. Oh, no.

Q. You realize that they are an essential part--

A. Absolutely.

Q. --of a sewerage system in a city like Kansas City?

A. Absolutely.

Q. And I think you realize that we need more trunk sewerage in Kansas City, Missouri?

A. Right.

Q. And I think further, the question by counsel for the government indicated that the pay-as-you-go plan should be instituted immediately, you might realize that it is possible that by so doing you would discourage the adoption of the twenty million dollar GO bond issue in November of this year?

MR. STEIN: Mr. Chairman, we would have to interpose an objection. I think our question speaks for itself. The indication of our question is a conclusion of counsel and not necessarily what we intended either way.

CHAIRMAN WILSON: The objection will be overruled. As with other matters at this hearing, the Board, I think, is inclined to be quite liberal in the admission of evidence and when it is all in we will sift it and apply what we consider to be relevant and material and disregard the rest.

MR. KOENIGSDORF: Thank you, sir.

CHAIRMAN WILSON: With that understanding you may proceed, counsel.

MR. KOENIGSDORF: No further questions.

CHAIRMAN WILSON: At any rate, whatever answers have been given or statements made may stand subject to my comments.

MR. KOENIGSDORF: I don't know if there was an answer to the last question. I am not sure I finished the question.

THE WITNESS: All right, restate it.

MR. KOENIGSDORF: I don't believe it needs an answer.

Mr. Powers would like to ask a question.

CHAIRMAN WILSON: Any further cross-examination by counsel?

CROSS-EXAMINATION

BY MR. POWERS:

Q. Mr. Smith, from your statement of what is happening in these other cities, they are all submitting their bond issues or financing to the people of those respective cities, are they not?

A. That is correct.

Q. And there is no reason why Kansas City should not do the same, do you know?

A. Are you asking me whether or not I think Kansas City ought to submit a bond issue for treatment? I don't know as I understand your question.

Q. No, I am just calling your attention to the fact that all these other Missouri cities and all the others, as far as that is concerned, go to the people for bond authorizations.

A. That is correct.

Q. And Kansas City is going to the people for the equivalent. Do you see any distinction in principle between those two situations?

A. Well, I think I do. This is entirely--I know of no city who has proposed a bond issue for sewers and if that passes they will then enact a sewer service charge for treatment. I know of no comparable situation. In other words, cities vote for a specific purpose, for treatment, for trunk sewers, or a combination of both.

Q. Then what happens if the people of these cities do not vote the bonds that they have submitted?

A. They try it again.

Q. What?

A. Try it again, resubmit it.

Q. Would you feel better if Kansas City submitted a combined twenty million dollar or one proposition for twenty million dollar sewer revenue bonds which would impose a large interest charge on the city together with a twenty million dollar general obligation bond proposition?

A. Well, Mr. Powers, I am not a financial expert and I don't think it is incumbent upon me to advise what Kansas City ought to do in the way of financing. I don't think that is our business. We are concerned with sewage treatment and what happens to the river, and how you finance it is a local matter, not for the State Board to pass upon, in my opinion.

MR. POWERS: Thank you.

CHAIRMAN WILSON: Any further questions?

Members of the Board?

Q. (By Mr. Ridge) Would you tell me, if you know, whether a revenue bond issue requires a two-thirds vote or not?

A. A revenue bond issue requires four-sevenths.

MR. KOENIGSDORF: A slight difference.

A. A slight difference.

MR. RIDGE: Thank you.

MR. POOLE: Mr. Chairman, I have a question I guess directed to counsel, but I presume we are going to hear more of the details of this pay-as-you-go plan in Kansas City, over-all plan, later on, aren't we?

MR. KOENIGSDORF: No, sir, I don't expect that we are going to go into it any more than we have in advising that such a plan is in the--has been accepted by the council subject to this vote. Is there some particular phase? We would be glad to have it explained if there is a particular phase of it that the Commission would like to hear.

MR. POOLE: Well, yes, I am quite curious as to the time that would be involved in the construction of sewage treatment plants for the entire city under this pay-as-you-go plan and also the amount of money that would be involved.

MR. KOENIGSDORF: The exhibit will speak for itself on the time schedule. The election is November 8, 1960. On December 1, 1960, the following month, on or before this date, complete interdepartment and other necessary administrative detail, and submit, have hearings upon and adopt necessary ordinances to commence the pollution abatement charge and commence all necessary action for installation of trunk sewerage. That is within three weeks after the election.

Then I read the beginning part on Turkey Creek which starts December 1, 1961, as completed 1963. On July 1, 1964, engineering detail completed, submitted to the Water Pollution Board of Missouri for the sewage treatment of the Blue River outfall. December 1, 1964, award the contract for the construction of the Blue River outfall. December 1, 1965, facilities of the Blue River outfall to be in operation.

Then the remaining--you see, those two outfalls are the major problem that the city would have. The others consist of interceptors and smaller treatment plants.

And January 1, 1966, this schedule provides that the engineering will be completed and submitted to the Water Pollution Board for all of the remaining outfalls and by December 31, 1966, all of the sewage treatment required would be constructed and in operation.

MR. POOLE: That is a time table, then, of about six and a half years from now or six years from November, the date of the bond election. Well, now, I am a little fuzzy on this pay-as-you-go business. I presume these facilities you have enumerated here that you expect to complete by January 1, 1966, cost several million dollars?

MR. KOENIGSDORF: About, I think, roughly twenty million dollars.

CHAIRMAN WILSON: How much?

MR. KOENIGSDORF: Twenty million dollars, sir.

CHAIRMAN WILSON: Is that for the trunk line sewers or--

MR. KOENIGSDORF: No, that is for the sewage treatment plants for this particular--as are now needed. Now, if the city expands, I think these plans provide for expansion of the treatment plants. It will be expandable.

MR. POOLE: Well, then, as I understand the pay-as-you-go plan, you would raise the water rates, we will say, around January 1961, or some date shortly thereafter?

MR. KOENIGSDORF: No, December of 1960.

MR. POOLE: And you would raise those water rates sufficiently that in the interim between December 1960 and the date when you would let your last contract, which presumably would be around January 1966, so that you will accumulate--

MR. KOENIGSDORF: It will be completed by then, sir--oh, January 1966, you are right.

MR. POOLE: I am just guessing, a year for construction of the last phase of it.

MR. KOENIGSDORF: Yes.

MR. POOLE: But in that five-year period, then you will have had to take in twenty million dollars as a result of an increase in your water rate?

MR. KOENIGSDORF: Yes, sir. It approximately--well, the figure is rough, but from 85 percent to 100 percent roughly of the present water bill.

MR. POOLE: In other words, you can do that by roughly doubling the present water bill?

MR. KOENIGSDORF: That is correct, sir. Now, I should explain to you that Kansas City, and I think most of these by charter and statute, cannot enter into a contract unless they have funds on hand and the contract must be certified that funds are on hand before it is entered into. Also, of course, we cannot purchase sites until we have funds on hand. And that is why this schedule is worked out so that as funds are accumulated contracts are entered into and sites are acquired. It is not much different on time table than if it were done by revenue bonds. In fact, I think it is the same as in our engineering plan or the previous plan that was proposed timewise, or very close to it, because you can't have our construction firms in town doing all of these at one time.

MR. POOLE: That is right.

MR. KOENIGSDORF: It has to take time. And scheduled over this period of time it is within the contemplation, I think, of all parties as to what would be a minimal time.

MR. POOLE: What I was trying to arrive at was whether this pay-as-you-go was going to impose such an added charge on the people that they might not stand hitched for it, and I think you have answered my question.

MR. KOENIGSDORF: Well, sir, it will also include sufficient funds for the maintenance and operation of the facilities as they are constructed.

MR. POOLE: And you estimate you can do that at not more than 100 percent increase in the water rate?

MR. KOENIGSDORF: That has been worked out on the actual figures of the water department. I think it is better than an estimate and that it is a fairly accurate figure.

MR. POOLE. That is all. Thank you.

CHAIRMAN WILSON: Any other questions?

MR. JOHNSON: Yes, Mr. Chairman.

CHAIRMAN WILSON: Mr. Johnson.

MR. JOHNSON: Mr. Koenigsdorf, I want to see if I am perfectly clear in my mind that this entire plan, pay-as-you-go, bond issue, all, hinges upon the bonds carrying; nothing will be carried if they fall?

MR. KOENIGSDORF: Well, you are asking me as to a policy matter, which I cannot say what the council would do if the bonds failed. They might adopt the pay-as-you-go plan regardless, I can't tell you. But for the time being, until such a vote is cast the council does not feel that they should arbitarily on their own initiative impose this particular charge.

MR. JOHNSON: Thank you.

Q. (By Mr. Poole) Mr. Smith, we have been talking of trunk sewers here and treatment plants. What about the interceptor sewers? Are the interceptor sewers covered in this trunk sewer program? I am meaning now the sewers that will have to parallel the river and pick up all of these various outlets that we have seen marked on the maps.

A. The interceptors are in connection with the treatment plant. In other words, that is part of the pay-as-you-go plan, interceptors and treatment.

Q. And you have an over-all estimate of about twenty million dollars for those interceptors--

A. And treatment.

Q. --and what I assume might be three treatment plants?

A. That is correct.

Q. At least two?

A. You are about right, three; two on this side and one on the other side of the river.

MR. POOLE: That is all.

Q. (By Mr. Koenigsdorf) Might be more than that, including small treatment plants? I am not sure of all the engineering.

A. Well, that is--north of the river is in stages, as I recall. I think the final stage would probably wind up with one plant on the north side of the river, one plant at the Blue River, one plant at the Turkey Creek Sewer.

CHAIRMAN WILSON: Other questions?

Q. (By Mr. Samson) Well, Mr. Smith, I just have a question or two. As I understand it, then, that the over-all cost of the interceptor treatment and trunk lines will amount to about forty million dollars?

A. That is correct.

Q. And that will clean up the Kansas and the Missouri Rivers and achieve generally the objectives of a clean river?

A. That is correct.

Q. That does not include the Kansas City, Kansas, problem, though, does it?

A. Oh, no.

Q. But does it include the Sugar Creek, the Blue River and the Sugar Creek, Missouri?

MR. KOENIGSDORF: Turkey Creek.

MR. SAMSON: No, I am talking about--

A. Sugar Creek, the City of Sugar Creek and the City of Independence have already voted their bonds--

Q. (By Mr. Samson) I see. Very well.

A. That has nothing to do with this project.

Q. But it does include the Turkey Creek problem?

A. Yes, that is correct.

MR. SAMSON: Thank you.

CHAIRMAN WILSON: Any other questions?

MR. RIDGE: Yes, Mr. Chairman, there is a question of financing that is bothering me, I mean that I can't understand. I think if counsel will answer the question, I would have to direct it to him. He brought it out.

CHAIRMAN WILSON: Go ahead.

MR. RIDGE: As I understand it, this pay-as-you-go is to save the city money, the people of the city money, from lack of interest or saving interest. But now I am getting the idea that you intend to collect this twenty million dollars from the water users in roughly six years.

MR. KOENIGSDORF: That is right.

MR. RIDGE: Well, as I see it, then, the interest, the maximum interest that could be needed, even if you took the bond issue today and used the money today, which of course you wouldn't under any plan--

MR. KOENIGSDORF: No.

MR. RIDGE: --would be about 18 percent of the twenty million dollars or, well, what, four million dollars, less, three or four million dollars?

MR. KOENIGSDORF: Of course you don't sell six-year revenue bonds and if you did you would have to extend them for a number of more years to pay the interest on them. But if we have a revenue bond issue it would probably be on a, I assume, 20- or 25-year basis with considerable interest. I don't believe you would ever sell a bond issue to the voters on a six-year project and I think you might have trouble selling it to them.

MR. RIDGE: What are your possibilities for short-term bonds?

MR. KOENIGSDORF: We have not used short-term bonds. We, of course, have some short-term borrowing for which we pledge our general revenue. We can't sell those. I don't think you can sell short-term bonds. At least we haven't even considered it in view of the advice that we have had.

MR. RIDGE: If that were possible, there wouldn't be too much difference in cost, then, by doing it in three years or doing it in six years?

MR. KOENIGSDORF: Well, whatever the interest cost would be, that would be the saving. And it was felt by the council that this can be done without interest funds, whatever the amount might be. I think it is substantial, though, when you start computing.

MR. RIDGE: That is all I have.

MR. STEIN: Mr. Chairman, and I don't want this to be argumentative, just for clarification, I think we respect counsel's view on selling short-term bonds, but in our experience there is nothing to prohibit it as a possibility. This is not the usual case, but I don't think either of us is necessarily qualified as finance experts.

MR. KOENIGSDORF: No, I will certainly agree with you, counsel, that I only know what I am told about that sort of thing.

MR. STEIN: That is right.

MR. KOENIGSDORF: And I still think that the question of how to finance and how to do these things is a question for the elected representatives of the people.

MR. STEIN: That is right.

MR. KOENIGSDORF: They have to decide how it is to be done as long as the job is done, and that is what the State Board is interested in and I assume the Commission is interested in. How it is financed is the city's problem.

MR. RIDGE: I am afraid that makes it necessary for me to ask one other question or make this statement, that I had no intention of getting into Kansas City's business. I am interested in the schedule and whether that would--how that would increase the cost. This schedule is what I am interested in.

MR. KOENIGSDORF: Which schedule is that, sir?

MR. RIDGE: Of the pollution abatement. This is what I was going to get at.

MR. KOENIGSDORF: I don't believe I follow your question.

MR. RIDGE: This is a six-year schedule.

MR. KOENIGSDORF: That is right, sir.

MR. RIDGE: I was trying to get the figures on a four-year schedule or a three-year schedule or something on that order, what the effect would be of changing it, not trying to tell you how to finance it.

MR. KOENIGSDORF: Well, I didn't mean that. I can't answer what the figures would be on four or less time. This six years, of course, was picked apparently for the reason that the engineering and construction, and so forth, figured it would take about that long in view of the work source, labor source, and everything else in the community, so that was the figure that was taken. I suppose it could have been eight or ten or four. There is no way of telling why it was picked, but with everything taken into consideration they figured six years was the time.

MR. RIDGE: That is the point I was trying to make, whether the financing had anything to do with it.

MR. JOHNSON: Dick, it also provided your money as you needed it, didn't it, on a six-year schedule?

MR. KOENIGSDORF: That is right.

MR. JOHNSON: I mean as certain construction came up you would have the money available?

MR. KOENIGSDORF: As each phase came up we would have the money available to enter into a contract for purchase or construction or engineering.

CHAIRMAN WILSON: Any other questions?

Q. (By Chairman Wilson) Mr. Smith.

A. Yes, sir.

Q. Although you say you are not a financial expert, undoubtedly from examining the plans and proposals for construction that have been submitted to your Board by various municipalities in the state, you are more or less familiar with the ways that they finance these projects--

A. That is correct.

Q. --and with the time that it takes to complete them under different methods of financing?

A. That is correct.

Q. I first want to clear up one question. If I understood you correctly, in Missouri it is necessary to submit not only general obligation bonds but revenue bonds to a vote of the people; the only difference is that a lesser majority is required for the revenue bonds?

A. That is correct.

Q. You do not have the statutes that they have in some other states whereby a city council may issue revenue bonds without a vote of the people?

A. That is correct.

Q. And I assume that the charter of Kansas City makes no such provision, so that in either event a bond election would be necessary?

A. Well, I am not familiar with the provisions of the Kansas City charter. The city counselor has said that it is legal.

Q. Yes--

MR. KOENIGSDORF: No.

CHAIRMAN WILSON: As far as any--

MR. KOENIGSDORF: Not as to issuing revenue bonds.

A. No, that is pay-as-you-go. That is correct.

MR. KOENIGSDORF: It would have to be put to a vote of the people under the charter or the state statute.

A. I am thinking of a pay-as-you-go plan. They say that a pay-as-you-go plan is legal, not that a sale of bonds is; no, they didn't say that.

Q. (By Chairman Wilson) I am talking about borrowing money on bonds. In any event, a proposal to borrow money on bonds must be submitted to a vote of the people?

A. That is correct, Kansas City or anywhere, that is correct.

Q. Now, there have been introduced in evidence here various engineering reports on the problems here at Kansas City and the metropolitan area. You are familiar with those, I assume?

A. Yes.

Q. Does any of them comprise a complete preliminary report or proposal for the construction of adequate sewage treatment facilities for the City of Kansas City, Missouri?

A. Mr. Chairman--

Q. As far as submitted to your Board?

A. --I am not familiar with all reports that have been submitted here. I will have to ask a question. Have the Black and Veatch and Haskins, Riddle and Sharp reports been introduced?

Q. Yes.

A. Then those reports do cover sewage treatment that is adequate in our opinion for Kansas City, Missouri.

Q. But has a complete proposal been submitted to your Board for approval by the city officially or does that still remain to be submitted?

A. Now, they have submitted this program that we mentioned in our testimony, the pay-as-you-go plan and the bond issue, the cost of which and the scope of which is based upon the engineering reports of Black and Veatch and Haskins, Riddle and Sharp.

Q. Let me clear this up. Under your law is it necessary, as it is in most other states, for the city before proceeding with complete plans and the letting of contracts to secure the approval of the proposed plans by your Board?

A. That is correct.

Q. And as I understand it, no such approval has yet been granted?

A. Now--

Q. Or am I wrong?

A. Yes, I think we have to back up here a minute. The engineering reports have been approved by the Water Pollution Board.

Q. Very well. Then that is the situation, the engineering reports have been approved?

A. That is correct.

Q. So that there is no longer any uncertainty as to the actual work that is to be done?

A. That is correct.

MR. KOENIGSDORF: May I clarify that a moment, sir?

CHAIRMAN WILSON: Yes.

MR. KOENIGSDORF: The general engineering plan has been approved, but detailed engineering for each particular project has not been prepared and approved and would be done so at the time that the funds are available to get started on those.

THE WITNESS: I understood the question was preliminary engineering reports.

CHAIRMAN WILSON: That is right.

MR. KOENIGSDORF: I believe your answer was right, but I believe in order to clarify it we ought to distinguish between the detailed plans and the preliminary plans.

THE WITNESS: That is right.

CHAIRMAN WILSON: Well, in the ordinary course of procedure the general plans or preliminary plans must first be approved by the state agency?

MR. KOENIGSDORF: Which has been done.

THE WITNESS: Yes.

CHAIRMAN WILSON: And then after such approval the municipality proceeds to have its engineers develop the plans in detail with specifications so that contracts can be let?

MR. KOENIGSDORF: That is correct.

Q. (By Chairman Wilson) The latter procedure has not yet been accomplished, is my understanding?

A. That is correct. That is correct.

Q. But you have approved the general plans, the preliminary?

A. That is correct. Right.

Q. Now, do you have any information in the experience of your Board from which you can tell or give an estimate as to the difference in time that would be required if this project were completely financed by a bond issue as compared with this pay-as-you-go plan?

A. Yes.

Q. You do have some information, Mr. Smith?

A. Yes.

Q. Based on your experience with other cities?

A. Well, based on my experience and based on the statement of the city.

Q. Then will you just tell us within what time you think the necessary steps to accomplish complete sewage treatment in Kansas City, Missouri, could be accomplished by bond issues as compared with the time that will be taken as stated in this pay-as-you-go plan?

A. Slightly over two years.

Q. You mean that the facilities could be placed in operation in slightly over two years--

A. That is correct. That is from the time of awarding the first contract to completion.

Q. How soon could the first contract be awarded?

A. Approximately six months following authorization of the city to the engineers to proceed with detailed plans.

Q. That would have to follow the approval of the bond issue?

A. Or financing, correct.

Q. Let's take it step by step, then, from what you know about the way bond issues have gone in Missouri. How long would it take to set up a proposal for a bond issue and have an election on it in Kansas City?

A. Well, this is purely an estimate on my part, but I would think somewhere in the neighborhood of three to four months of an intensive educational campaign would be sufficient.

Q. As I understand it, from this proposal for a bond issue on the trunk line sewers, that would be submitted next fall, would it not?

A. Yes.

Q. Under your statute could a bond issue for the entire project, including both the trunk line sewers, the interceptors and the sewage treatment plant, be submitted at the same time?

A. Yes.

Q. And then how long after that would it take before advertisements for bids could be made?

A. Six months.

Q. And then how long for construction?

A. Two years.

Q. So that within three years from the present date, and that allows a considerable margin, within three years from the present date at the outside it should be possible to get this project in complete operation if bond issues were used?

A. That is correct.

Q. In other words, about half the time that it would take under this pay-as-you go plan?

A. Correct.

CHAIRMAN WILSON: That is all.

MR. KOENIGSDORF: I know the Board knows that I am not trying to mislead the Board on time.

Q. (By Mr. Koenigsdorf) What are you reading from?

A. I am reading from--

Q. Because I don't know.

A. --the transcript December 3, 1957. That was from the schedule proposed by the city. The timing following financing is largely an engineering matter. In other words, how long does it take to prepare the plans, how long does it take to complete the construction. And I assume that this was based upon information from the consulting engineers. That is usually the basis.

Q. Who made the statement, Mr. Smith?

A. This was Mayor Bartle's statement at the conference. And, as I say, I assume it is based on engineering.

MR. SAMSON: Is he still the mayor?

MR. KOENIGSDORF: He is still the mayor.

A. As a matter of fact, we--I say I have checked with engineers to determine whether or not this kind of a schedule is still realistic as to planning, detailed planning, and as to construction and I am advised that it is.

Q. (By Mr. Koenigsdorf) Does that include all sewers in the area?

A. That includes interceptor sewers and treatment, the entire project, the Turkey Creek, Blue River and the north side.

Q. Is there a detail for each one set up in there?

A. No. No, if I may read it, "January 12, 1960"--

CHAIRMAN WILSON: From what are you reading now?

THE WITNESS: From the transcript of the conference "Pollution of Interstate Waters Missouri River, Kansas City Metropolitan Area, December 3, 1957."

CHAIRMAN WILSON: Is that in evidence?

MR. STEIN: No, that has not been placed in evidence. We would be glad to do that, if you want it.

MR. KOENIGSDORF: As far as I am concerned, I have no objection to his reading this particular thing. He was there, as I understand it.

Q. (By Mr. Koenigsdorf) Were you not?

A. Yes, I was there.

MR. KOENIGSDORF: It is only a matter of refreshing his memory and I would have no objection to him reading it if government or Kansas City, Kansas, and other parties have no objection.

CHAIRMAN WILSON: Very well. Go ahead, Mr. Smith.

A. "September 1, 1959, submission of bond proposal to electorate of Kansas City. If proposal receives approval of voters, then the following schedule will be our objective:

"January 1, 1960, award of first construction contract on some principal phase of the work.

"March 1, 1960, award contracts for balance of the system.

"March 1, 1962, completion and start of full operation of the treatment facilities."

That is the whole works.

MR. KOENIGSDORF: I have never seen us move that fast yet.

Q. (By Mr. Stein) For purposes of clarification and refreshing your memory, would you turn to page 7 of that? And I think this would clarify that. Did the mayor say when he made this statement also this, and I think you were there, Mr. Smith: "I do want to say"--and I think I am quoting the mayor--"Mr. Chairman and gentlemen of the panel, that this statement as drawn represents the composite thinking of the nine members of the city council of Kansas City, Missouri, who have given considerable thought to the problem at hand and they do recognize it as a problem. It is not the thinking of any single individual. It is, indeed, the belief and conviction of all nine duly-elected members of the city council after conferring at length with members of our administrative staff who were wrestling with the problem and giving full and thoughtful consideration to all of the ramifications related thereto for a period of days, weeks, months, years." Was that--

A. That is a correct statement.

CHAIRMAN WILSON: Any other questions?

MR. KOENIGSDORF: No. I appreciate the help of government counsel, though, in carrying on my case.

Q. (By Mr. Koenigsdorf) Are you familiar with Cincinnati, Ohio, and its sewage treatment, development of its facilities?

A. In a general way.

Q. I believe the Ohio River is a model and all that for this cleared stream program?

A. Well, I would say they have done a remarkable job. I don't know whether they are a model or not.

Q. Do you know how long a program Cincinnati, Ohio, had for construction of its sewage treatment facilities?

A. No, I do not.

Q. Now, sir, the Board of the State of Missouri considered this plan which included six years in the program, did they not?

A. They considered it, yes.

Q. And they did, as I understood it, adopt that if it were put into effect, if that plan was adopted on a time table? As I read the resolution or heard you read the resolution, it said something about pay-as-you-go and that the time schedule was all right.

A. May I read from the resolution just to refresh my memory?

Q. All right.

A. "Because it is the opinion of this Board that the implementation of the plan presented will abate pollution of the Missouri River that no further action be taken at this time, and, two, that previously imposed sewer extension restrictions will be removed at such time as the proposed pay-as-you-go or other effective plan for financing pollution abatement works in accordance with the schedule contained in resolution 25110 has been placed in full force and effect." I would say that your program was approved.

Q. Can we reasonably infer that that includes approval of this plan?

A. I think so, yes.

Q. All right. So the Board of the State of Missouri did not feel that the time schedule was unreasonable, or at least they approved it, is that right, sir?

A. Well, I would say that -

Q. All right.

A. I would say that they were probably unhappy with the time, it wasn't the most desirable, but they felt it was approvable.

Q. Thought it was reasonable enough that they did approve it?

A. That is correct.

MR. KOENIGSDORF: No further questions.

Q. (By Chairman Wilson) Mr. Smith, as I understand it from the resolution which you have just reread, which you read for the first time yesterday, the State Pollution Board has never lifted the restrictions on the sewer extensions that were mentioned in connection with that resolution?

A. That is correct.

Q. Before lifting those restrictions they are waiting for the actual submission of some kind of a legally-approved financing plan to show that the plan is being put into operation, either this pay-as-you-go plan or some other plan?

A. Implementation of the plan, correct.

Q. Do you know whether or not the city has actually proceeded with those sewer extensions?

A. It is my understanding that the city gave permission to these subdividers to build the sewers. It is my understanding it is not the intention of Kansas City to build the sewers, but to grant permission for someone else to build the sewers. To my knowledge those sewers have not been placed under construction.

CHAIRMAN WILSON: Any other questions?

That is all, Mr. Smith.

Before the government calls another witness, in view of matters that were brought out in connection with the testimony of Mr. Smith, and especially in view of a comment which I understood to be made by Mr. Koenigsdorf, I should like to say at this time that I think that this Board would be interested in receiving specific information from the city or its engineers or financial experts on the question that I asked Mr. Smith and on the questions that were indicated by Mr. Ridge, a member of the Board, and that is to say, first, as to how much the city would actually save in the way of interest or other carrying charges by this pay-as-you-go plan as compared with the bond issue and, second, as to the time that would be required for complete construction of the sewage treatment facilities under the pay-as-you-go plan as compared with the bond issue plan.

MR. KOENIGSDORF: I believe maybe we could do that without a lot of trouble, Mr. Chairman. I imagine Mr. Smith has a copy of the pay-as-you-go plan right in his file there.

THE WITNESS: Yes. Yes.

MR. KOENIGSDORF: And I have a very complete document here prepared by our finance department which shows the various types of of financing that were considered, which is well worked out, and it shows our GO and also revenue bond charges as estimated and is a very complete summary. In the interest--

CHAIRMAN WILSON: May I say, Mr. Koenigsdorf, I do not want to interrupt the government's case here for the purpose of going into that in detail. But in view of a remark, maybe I misunderstood you, in connection with something that was asked of this witness, you indicated that you didn't intend to go into any further detail on certain matters. I am making this statement at this time that this Board will certainly be interested in specific information on those points because they are very material issues at this hearing. So I am merely stating that at this time so that you may be prepared to submit that information if you have it, but I don't wish to interrupt the continuance of the government's case to take that information now.

MR. KOENIGSDORF: The matter is documented and I think maybe it would be just as easy, if the government has no objection, and Kansas City, Kansas, has none, to take from Mr. Smith his copy of the plan and put it into the official record.

CHAIRMAN WILSON: Well, if you can do that very shortly, proceed.

MR. STEIN: I think Mr. Smith would have the objection. It is his copy.

MR. KOENIGSDORF: Mr. Smith will have trouble, because I have had so many requests I don't have a copy.

MR. STEIN: We have no objection.

THE WITNESS: I have only one copy.

MR. KOENIGSDORF: Maybe we can get you another one.

THE WITNESS: All right.

MR. KOENIGSDORF: If you don't mind. It is a little bit out of order, but maybe it will save some time.

CHAIRMAN WILSON: Anything that will save time.

SECRETARY AYERS: Are you going to mark that as a government exhibit?

MR. KOENIGSDORF: Mark it as Kansas City, Missouri, Exhibit.

SECRETARY AYERS: No. 2.

(Kansas City, Missouri, Exhibit No. 2 marked for identification.)

Q. (By Mr. Koenigsdorf) Mr. Smith, I hold in my hand a document I just received from you marked Kansas City, Missouri, Exhibit No. 2, entitled "A Report on the Feasibility of Abating Present Kansas City, Missouri, River Pollution on a Pay-As-You-Go Basis." Do you recognize that as a copy furnished to you by Kansas City, Missouri, and which is a part of the official records of the State Pollution Board?

A. Right.

MR. KOENIGSDORF: It is dated March 17, 1960.

CHAIRMAN WILSON: Any objection?

MR. KOENIGSDORF: I haven't offered it. I offer so much of the Kansas City, Missouri, Exhibit No. 2 as is explanatory of the so-called pay-as-you-go plan and the figures that are contained in there and the charts that are contained which pertain to the financing cost. I do not offer the hearsay matter of--I don't recall what is in it, but I won't offer all of the explanation of the sewage system, and so forth, that is included in here; just the pay-as-you-go plan.

MR. EDELMAN: No objection.

MR. STEIN: No objection.

CHAIRMAN WILSON: With that understanding, it will be received.

(Kansas City, Missouri, Exhibit No. 2 received in evidence.)

MR. KOENIGSDORF: As a matter of procedure, Mr. Chairman, rather than have that explained by the witness or go through the figures, I believe the document will speak for itself and we will just leave it in the record for consideration by the Commission, subject only to the restriction that it was offered with limitation.

CHAIRMAN WILSON: It will be so understood.

Is everyone through with this witness now?

MR. STEIN: Yes.

CHAIRMAN WILSON: Thank you, Mr. Smith.

(Witness excused)

CHAIRMAN WILSON: We will take a recess for ten minutes.

(RECESS)

CHAIRMAN WILSON: The hearing will come to order.

You may proceed.

SECRETARY AYERS: Mr. Chairman, during the recess Mr. Herbert M. Wiggs, the president of the Chamber of Commerce of Kansas City, Missouri, approached me and asked me if he might make a statement. His statement I hold in my hand and I imagine it would take less than 30 seconds. He is now present in the courtroom.

MR. STEIN: No objection.

CHAIRMAN WILSON: Any objection by any counsel to the reading of the statement?

MR. BRENNEISEN: No objection.

CHAIRMAN WILSON: Will the representative come forward, please.

In order to comply with the regulations, you may as well be sworn, if you don't mind.

HERBERT M. WIGGS,

called as a witness on behalf of the Chamber of Commerce of Kansas City, Missouri, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY CHAIRMAN WILSON:

Q. Give the reporter your full name and address and position, please.

A. Herbert M. Wiggs.

Q. How do you spell the last name?

A. W-i-g-g-s. President of the Kansas City, Missouri, Chamber of Commerce.

Q. And you wish to submit a statement?

A. Yes.

Q. Go ahead, Mr. Wiggs.

A. My name is Herbert M. Wiggs, president of the Chamber of Commerce of Kansas City, Missouri.

The Chamber of Commerce has devoted considerable time and study to the question of pollution of the Missouri River and tributaries.

We believe that serious pollution in fact does exist. We believe that such pollution is detrimental to downstream communities and water users, and harmful to the total welfare of Kansas City.

The Chamber of Commerce has, therefore, urged the city council to adopt a pollution abatement plan to meet the requirements of the United States Public Health Service, the Missouri Pollution Board and the growing needs of Kansas City.

Thank you.

CHAIRMAN WILSON: Just a minute. Any questions by any counsel?

MR. KOENIGSDORF: Mr. Wiggs, we, of course, appreciate the fine work the Chamber of Commerce does and the sincere interest that the Chamber has in the community activities, and are fully in sympathy with all of their work toward a bigger and better Kansas City.

I would like to interpose an objection to the statement at this time, however, on a technical ground, in that I would like to object to so much of it as invades the province of the Commission in that it concludes the ultimate point which is in dispute here or, at least, which you are hearing the matter for as to whether there is pollution by a statement that the Chamber believes that there is. I think that is an invasion of the province and is a conclusion on the part of the witness.

I would like to move that so much of it as contains such conclusions be stricken from the record.

CHAIRMAN WILSON: The motion will be denied. The statement will be received subject to the objection and subject to the general rule that the Board will base its decision on relevant and material evidence and sift out that which it considers irrelevant or immaterial.

(Witness excused)

MR. STEIN: Mr. Harris.

R. H. HARRIS,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. EDELMAN:

Q. Please give your full name and address for the record, Mr. Harris.

A. R. H. Harris, 6211 Jackson Street.

Q. That is in Kansas City, Missouri?

A. Kansas City.

Q. What is your employment, Mr. Harris?

A. My regular employment, I have a full-time job with the--

CHAIRMAN WILSON: Speak up so the members of the Board can hear you over at this end.

A. I am a printer with the Kansas City Star.

Q. (By Mr. Edelman) Are you also a part-time commercial fisherman?

A. That is right.

Q. Do you hold a commercial license?

A. Yes.

Q. Where do you do your fishing?

A. At the present I am doing most of my fishing right down below the Chouteau Bridge, between the Chouteau Bridge and the Truman Bridge.

Q. Is that in the Kansas City Metropolitan Area?

A. I believe so, yes.

Q. Well, is that below where the Kansas River and the Missouri River meet?

A. Oh, yes.

Q. Mr. Harris, I call your attention to Government Exhibit 13, which is a chart of this area. Do you think you could bv reference to this chart indicate where the Chouteau Bridge is? This (indicating) is where the Kansas and Missouri meet. I am pointing to Government Exhibit No. 13.

A. Which is down river?

Q. This is downstream.

A. Right here (indicating).

MR. EDELMAN: The witness indicates on Government Exhibit 13 where it looks like Missouri Pacific--a railroad bridge across there where the legend "Clay County and Jackson County" appears on the river bed.

Q. (By Mr. Edelman) Have you ever fished closer to Kansas City, Mr. Harris?

A. No. That is about as close as I --

CHAIRMAN WILSON: How close is that from Kansas City?

A. Well, it is right here in Kansas City.

CHAIRMAN WILSON: What is it?

A. Yes, it is.

Q. (By Mr. Edelman) It is in the city limits?

A. It is in the city limits.

CHAIRMAN WILSON: Oh, it is in the city limits. But below the junction of the Kansas River?

MR. EDELMAN: That is right.

CHAIRMAN WILSON: How far from the junction with the Kansas River, then?

A. I would say about three or four miles.

Q. (By Mr. Edelman) Is there any particular reason why you don't fish further upstream?

A. Well, no, just it is more convenient for me to fish there.

Q. All right. Have you noticed any condition in the river that you find objectionable as you carry out your commercial fishing?

A. Yes, indeed.

Q. Will you describe it?

A. Well, from my standpoint as a fisherman, why, the oil in the river is the greatest complaint. As a matter of fact, it gets so bad at times we have to quit fishing altogether, you can't eat the fish, give them away, sell them or anything else. They taste like oil.

Q. Do you use nets in your fishing?

A. Mostly, yes, hoop nets, trammel nets.

Q. You leave the nets in the water for a period of time and then raise them, is that correct?

A. That is right, yes.

Q. Do you ever find anything other than fish in those nets when you raise them?

A. Well, yes. It is pretty disgusting sometimes when you raise those nets and find packing house refuse, human refuse, contraceptive devices and whatnot, and everything else in those nets.

Q. Do you find a ready market for your fish when people learn that they have been caught in the Missouri River?

A. No, I don't.

Q. You indicated you are a part-time commercial fisherman. Would you be interested in expanding your activities if you had a better market for fish you caught in the Missouri River?

A. Yes, indeed, I sure would.

Q. In your use of the river have you noticed any other people boating on the river?

A. Boating?

Q. Yes, using pleasure boats?

A. Oh, yes, there are a great number of people boating on the river now, a little bit more every year.

Q. In the area that you have described where you conduct your operations?

A. Yes.

MR. EDELMAN: That is all, Mr. Chairman.

CHAIRMAN WILSON: Any questions by counsel?

Members of the Commission?

MR. STEIN: Thank you, Mr. Harris.

(Witness excused)

JESSE FLASSING,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. STEIN:

Q. Would you state your name and address for the Board, Mr. Flassing?

A. Jesse Flassing, Conservation Commission.

CHAIRMAN WILSON: What was that name, please?

A. Jesse Flassing.

CHAIRMAN WILSON: How do you spell that name?

A. F-l-a-s-s-i-n-g. Conservation agent for the State of Missouri assigned to Clay County.

Q. (By Mr. Stein) Would you refer to the map, Government Exhibit 13, and indicate where Clay County is on that map, Mr. Flassing, just in general?

A. It is over on this (indicating), borders the north side generally.

Q. It is the north side of the Missouri River?

A. From below Missouri City about three or four miles to Riverside on the north side of the river.

Q. Thank you. Have you ever had occasion recently to look at the sewer outlets in Missouri in the Kansas City area?

A. The last time was last week end, last Saturday, I was on the levee in the North Kansas City area where some of the sewer outlets in that area are visible. The contents from those sewers appears to be generally in the same condition it has been for some time. At one sewer above the Chouteau Bridge about a quarter to a half mile there is considerable sewage going into the river and where there is any back eddy to it it is a bubbling gray mass of solution.

MR. SAMSON: Mr. Stein, would you fix that--

A. That is the last time that I have noticed any.

MR. SAMSON: Fix the location of that more definitely on Government Exhibit No. 13.

Q. (By Mr. Stein) I wonder if you could look at Government Exhibit No. 13 and try to indicate where the Chouteau Bridge is.

MR. STEIN: Maybe you can help him, Mr. Hopkins, to save time.

A. Directly almost south from the Winnwood area.

CHAIRMAN WILSON: Is that related by number to any of the outlets on Exhibit 14?

MR. STEIN: N-9 on Exhibit 14, I think.

CHAIRMAN WILSON: Which one?

MR. STEIN: N-9

CHAIRMAN WILSON: N-9.

Q. (By Mr. Stein) Is that correct?

A. Yes, sir.

Q. Thank you. When the Missouri River is low have you ever detected any odors in the river?

A. Yes, sir, particularly in the area above and near Missouri City the odor is quite evident when the river is at a normal or at a low stage for any period of time.

Q. Could you describe these odors? How do they smell to you?

A. Well, the odor has a smell of a sewer, whether that is very descriptive or not, but a general sewerage odor present.

Q. Have you ever seen oil slick on the river?

A. Have I ever seen what, sir?

Q. Oil slick.

A. Oh, yes, sir. There is generally oil in some degree on the river at most any normal stage.

Q. Do you ever see that oil slick cover duck decoys?

A. Yes, sir. Last fall, in November, about a mile above the power plant at Missouri City was the last instance of that I observed. The decoys left in the water and this oil slick and the wave action gets on the decoys in considerable quantity.

Q. As part of your official duties do you check on the fishermen in the area, particularly the commercial fishermen?

A. Yes, sir.

Q. Have they ever complained to you about the fish, the taste of the fish?

A. Yes, sir.

Q. What do they say?

A. They say that they have trouble disposing of them because of public kickbacks, that is they sell fish and then sometimes the public returns for their money.

Q. When did you come to Clay County first?

A. The 9th of November 1946.

Q. About how many commercial fishermen were there in your area then in Clay County holding licenses from the state?

A. I would say approximately 20 or 25 that were licensed in Clay County.

Q. How many do you have now?

A. I believe I have five part-time fishermen.

Q. Part time. Do you believe that the condition of the river had anything to do with this decline?

A. I would say that it did have because of the inability to sell the fish. It is one of the factors involved, yes, sir.

Q. Have you ever tasted fish caught there yourself?

A. Yes, sir.

Q. How do those fish taste to you?

A. Well, I was unable to eat them, sir.

Q. Because of what?

A. They tasted--had an oily taste similar to what you would expect from being exposed to coal oil distillate or something of that nature.

Q. On the basis of your experience in trying to eat these fish, would you say that this taste extended to all fish around there, whether they were carp, buffalo, cat or sturgeon?

A. I have had at least three personal experiences with fish of tasting that way. One time the fish involved were sturgeon, the hackleback sturgeon. The other time was carp and the third time was flathead catfish.

Q. Do you believe if the river were cleaned up that the sport and commercial fishing would increase in your stretch of the river?

A. It would increase, yes, sir, in my opinion.

Q. How about, do the people ever go down to your river there and try to seine some fish for a fish fry or do they have to go somewhere else?

A. Well, sir, I have had occasion to be contacted concerning removal of fish from some overflow water and in the course of talking to the individual I asked him about the Missouri River, he lived near the Missouri River, and he said that those fish wouldn't taste very good out of the river. That was his statement to me.

MR. STEIN: That is all. We have no further questions.

CHAIRMAN WILSON: Any questions, counsel?

CROSS-EXAMINATION

BY MR. POWERS:

Q. Mr. Flassing, you do supervise the river, the Missouri River, in the vicinity of Clay County, is that correct?

A. Well, I work Clay County, assigned to Clay County. However, I have been up and down the river as the state agent.

Q. And the Missouri Conservation Commission considers that it has jurisdiction over the Missouri River for this purpose?

A. The fishing, yes, sir.

Q. Has there been the development of a lot of other fishing places in the last few years since '46?

A. Complaints of what, sir?

Q. A lot of lakes to fish in for sport fishermen.

A. About lakes for sport fishermen?

Q. Yes.

A. Of course there has been considerable development started and some lakes completed. The Commission has a small lake building program which they are engaged in, for one thing, over the state.

Q. Pardon me?

A. Over the state there is a small lake program that is being administered by the Conservation Commission to aid communities in obtaining small lakes.

Q. And you are familiar with the new Lake Jacomo?

A. I am not very familiar with it, sir.

Q. You know that is a sizable lake--

A. Yes, sir.

Q. --just recently developed in this immediate vicinity, is that correct?

A. It is a sizable lake, I am familiar with that, yes, sir.

Q. And you are stocking it, are you not?

A. It is what?

Q. It is stocked, isn't it?

A. Yes, it is stocked. In fact, the Conservation Commission stocked it.

Q. The fish you get out of the Missouri River are, in any event, much less desirable than the game fish in these lakes, is that right?

A. Well, from a--I would say so, yes, sir, the fish don't have any bad taste, as far as I know, from the lake.

Q. Well, I mean the varieties of fish.

A. What?

Q. The varieties of fish in the lakes are more desirable for fishermen than the rough character in the Missouri River?

MR. PETE BRITZ: Hell, there is game fish in the river, man.

A. From a commercial standpoint, though, the carp and buffalo and flathead catfish are the main ones from a commercial standpoint, while your bass is more for sport purposes, but most of the fish consumed is carp and buffalo.

MR. POWERS: Thank you.

CHAIRMAN WILSON: Any other questions?

State your name, counsel.

MR. ELSON: Elson.

CROSS-EXAMINATION

BY MR. ELSON:

Q. I believe you testified that ten years or so ago there were 20 to 25 commercial fishermen who held licenses on the river?

A. Something in that number, along the Clay County side.

Q. Yes, sir. Are any figures maintained by the Commission as to the catch or the sale in terms of quantity by those licensed fishermen?

A. The commercial fishermen send in reports of their catch of pounds to the Conservation Commission. I do not have those figures, but there are figures concerning that take of fish from the Missouri River.

Q. Do you have in mind approximately what the comparison would be between the report in the days when there were 20 to 25 licenses as contrasted to the present time when there is a smaller number of licenses?

A. I wouldn't say, sir. I don't know what the--I know it would be less, but how much I--

Q. It wouldn't necessarily be at the ratio of five to ten, though?

A. No.

Q. I mean the number of licenses is not necessarily indicative of the number of fish that are being caught?

A. I might state the licenses that were being used then were greater, that is the number of hoop nets and trammel nets involved per person was greater than those of now. In fact, one commercial fisherman that I have has four nets and the others have one net apiece now and a trammel net or so for the others, which is a lot less equipment than was formerly used.

Q. Was the size of the nets relatively the same in the previous days as now?

A. The what?

Q. The size of the nets, the capacity.

A. Oh, yes, those nets are similar.

MR. ELSON: Thank you.

CHAIRMAN WILSON: Any other questions?

Q. (By Mr. Samson) Mr. Flassing, I have a couple of questions. If you will look at Exhibit 14, Government's Exhibit 14, and refer to N-1, N-2 and N-3, which is right up below the Kansas City water works treatment plant at North Kansas City, Missouri. Have you in the last six months or in the last year been up in that neighborhood and observed those outfalls?

A. No, sir. I believe the last time that I observed that from the river that I can recall was in October '57, I believe was the--as far as that particular--

Q. Well, that is a long ways back. That is over three years ago. But what did you observe at that time, if anything, in connection with those outfalls?

A. As I remember, the water works outlet had some type of white-colored solution going in the river, I don't know what it consisted of.

Q. Did you notice anything unusual or particular about N-2 and N-3, which apparently are right below the outfall there at the water treatment plant?

A. Not that I can recall, sir.

MR. SAMSON: Very well. That is all. Thank you very much.

CHAIRMAN WILSON: Any other questions?

Q. (By Chairman Wilson) Mr. Flassing, just a minute. This other outlet that you previously described, Exhibit N-9, which appears to be within the boundaries of North Kansas City, Missouri, was that a regular city sewer outlet?

A. Yes. That is my--I am not too familiar with the physical aspects of the sewers, what they drain, but it comes down what I believe to be Rock Creek, I think drains up in there, but this sewer outlet comes almost from due west northwest and what drains into it I am not sure.

Q. By what you saw coming out of it, did that appear to be ordinary city sewage?

A. Ordinary sewage and a little oil slick, not very much, but some.

CHAIRMAN WILSON: That is all.

MR. STEIN: Thank you, Mr. Flassing.

(Witness excused)

MR. STEIN: Mr. Thornton.

CHAIRMAN WILSON: Counsel, I don't wish to limit the government at all, but you are quite familiar with the rule on repetitious testimony and I might tell you, without wishing to influence you, that nothing is gained on accumulative evidence on matters that have already been established.

MR. STEIN: Yes, sir, we fully realize that.

CHAIRMAN WILSON: However, I certainly don't want to restrict you in case you have testimony to present on any new points that are material.

MR. STEIN: Yes.

SIDNEY THORNTON,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. EDELMAN:

Q. Will you give your full name and address?

A. My name is Sidney Thornton.

CHAIRMAN WILSON: How do you spell the last name?

A. T-h-o-r-n-t-o-n.

Q. (By Mr. Edelman) What is your address?

A. 617 Cedar Street, Kansas City 22, Missouri.

Q. What is your occupation, Mr. Thornton?

A. I have been several years with the main post office here, with the general post office on Pershing Road, about 12 years; I am a timekeeper.

Q. Do you hold a commercial fishing license?

A. Yes, sir, I do.

Q. Is that a part-time occupation?

A. Well, really to me it is. I love the river, I have been on it all my life, and I love the feel of the net. Actually I don't sell the fish because there is too much objections, see, to the condition of fish there. However, the river is still nice to me, I love boats, I love motors, and my kid loves them and we are out a lot. And what I have a license for is to keep the people like Mr. Flassing off my neck, because we are allowed to--we have to have a license to use a trammel net, see.

Another thing that occurs to me, if I might say it, is there was mention of other places to fish a while ago. Well, see, us people that like a net, we have in this vicinity only the Missouri River, you see, we are allowed the Missouri, the Mississippi and the St. Francis River, for commercial fishing, see. So while there are lakes, I don't fish in them with a rod and reel, I am too ignorant to even use one, so I am interested in the river.

Q. How long have you been on the river, Mr. Thornton?

A. Well, my daddy started taking me there before I remember and I will be 44 in December and I started fishing myself with a line when I was just short of nine years old, and that would be pretty near right now 35 years for my own, see.

Q. Have you observed the condition of the river over this 35-year period?

A. Yes, sir, I certainly have. Yes, sir, I believe I have been on it enough that I would know--I wouldn't know more than anyone about it, but I know a great deal about the river, yes, sir.

Q. Will you tell us whether the condition of the river in the area of Kansas City, Kansas, and Kansas City, Missouri, has improved or gotten worse in the last 35 years?

A. Well, it has got terrible. Once the people dipped water. In 1930 they dipped water out and let the sand settle, dumped it over into a bucket and drank it; I will swear to that, see. As the years go by it gets worse and worse until finally the only thing really so far as below the city here, it is actually shameful, see. There is a big difference between slightly above here and slightly below.

Q. You mean the river is cleaner slightly above than it is immediately below?

A. Yes. And I didn't say slightly cleaner, I said--yes, sir, slightly above the city it is much cleaner, yes, sir, much cleaner. There is a big difference in the river.

Q. Did you ever fish, were you ever a full-time commercial fisherman?

A. No, sir, I can't say I was, no, sir.

Q. Would you like to be a full-time commercial fisherman?

A. Well, I would like to stick with the job I have got and fish for the fun of it. However, if I could no longer work or retired, why, certainly I would like to be a full-time fisherman. I can retire in 13 years from now with a pretty good retirement, but I don't know whether the river would be cleaned up then sufficient to sell the fish or not.

MR. EDELMAN: That is all.

CHAIRMAN WILSON: Any questions?

CROSS-EXAMINATION

BY MR. KOENIGSDORF:

Q. Mr. Thornton, are you allowed to fish anywhere in the Missouri River?

A. Well, we are not supposed to fish within 300 yards of the mouth of the streams, if that is what you are getting after, or ditches.

Q. No, I am not-- Can you fish north of Kansas City or--

A. Yes, sir.

Q. --below Kansas City or any place?

A. Yes, sir. And getting above Kansas City, we are not supposed to attach our line onto the Kansas side of the river, see, and there is a slight place or two where I think the river is in Kansas, but I don't get that high. About the water works over here around Riverside is as far as I get and I hug the other bank until I get back down.

Q. Yes, sir, Mr. Thornton. But when you catch these fish up a little bit further up the river, do they have any taste or odor problem?

A. I love the river and I am not going to admit that the fish taste out of the river. Everybody else says they do, though, but I am still standing up for them.

Q. I am with you. I don't have any more questions.

A. I can't convince the rest of the people, though, see.

Q. You eat the fish yourself, do you?

A. Well, I have to answer yes, sir, I do.

Q. And you are a healthy-looking sort of fellow?

A. Oh, I am a little light, but I am in good health, yes, sir.

Q. You eat the fish out of the river and you are still healthy?

A. Yes, but I am pretty careful where the fish I eat come from, I am going to tell you that right now, I am careful where they come from.

Q. Above the city do you find a little better taste?

A. Well, if a fellow avoids the actual outfall of a sewer some place or other, it makes a lot of difference, see. A fish that hangs around there, when the water gets high it carries fish down, and in the wintertime the ice, fish are numb, they tumble down the river and they are good fish in the wintertime most any place you get them. Now, when the water falls this time, July we had better say, certain types of fish gather around the mouth of sewers. Naturally they are going to pick up, they call it, an oily taste, but it isn't necessarily oil, I expect, it is the water is brackish; I don't know whether it is oil. It is everything. I hope you gentlemen have seen what a sewer looks like dumping into the river. I am not going to try to describe what a man sees coming out of a sanitary sewer, but you can have an idea it is as bad as you can describe, you know. Like I said, it is almost a shame, actually, that anything like that is dumped in the river, see, because it seems that it should never be.

MR. KOENIGSDORF: I appreciate your testimony. Thank you.

THE WITNESS: Well, thank you.

MR. EDELMAN: Thank you, Mr. Thornton.

(Witness excused)

MR. STEIN: Mr. Reiff.

ANDREW REIFF,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. STEIN:

Q. Would you state your name and address, sir?

A. Andrew Reiff, Liberty, Missouri.

CHAIRMAN WILSON: How do you spell that last name?

A. R-e-i-f-f.

Q. (By Mr. Stein) What is your position, Mr. Reiff?

A. I am plant manager for the steam electric plant located near Missouri City.

Q. Is that on the banks of the Missouri River?

A. That is right, it is on the north bank.

Q. About how far below the confluence of the Missouri and the Kansas, would you say?

A. Well, I don't know the exact mileage, but it is at approximately Mile 351.

Q. Thank you. Do you use the Missouri River water for cooling water in your plant?

A. We do, we use it for condensing purposes in our condensers at the station.

Q. Have you ever found oil deposits on the intake of your power plant screens and condensers?

A. Yes, sir, we do.

Q. Has the odor of that water created unpleasant working conditions for the men in your plant?

A. It is very offensive to the personnel located at the station.

Q. Do you ever have feathers impregnated with oil and stuff clog your cooling water screens?

A. We do have quite frequently chicken feathers, chicken entrails, that sort of debris.

Q. What do you have to do to clean those screens?

A. Well, we have high velocity jets of water that impinge upon the back of the screens and forces the water from the screen and deposits it back in the river.

Q. Does this increase your operating costs?

A. To a certain extent, yes. Your pumping costs for the water and maintenance of the jet equipment.

Q. In connection with the operation of your power plant do you use dredges and small boats or drays?

A. Yes, sir, we do have.

Q. Have oil deposits on the hulls of these boats necessitated frequent cleaning?

A. Yes, sir.

Q. Do you ever have beer cans and debris interfering with your suction lines?

A. We have a lot of trouble with the beer cans.

Q. Have you ever had a personnel problem with your employees when they eat lunch?

A. Well, of course, it is not too pleasant. One of our greatest problems is when we open the condensers for cleaning or maintenance purposes, we have to use fans in order to aerate the interior because the odor is so offensive the men object to going in.

Q. Are you a duck hunter?

A. Yes, sir.

Q. Do you ever go down the Missouri River near your plant to do any duck hunting?

A. Well, I did when I first came to this area, but the last three or four years we stopped hunting entirely.

Q. Why.

A. Well, the ducks seem to change their fly-away, there are just no ducks available in this area.

MR. STEIN: Thank you. No further questions.

CHAIRMAN WILSON: Any cross-examination?

CROSS-EXAMINATION

BY MR. KOENIGSDORF:

Q. I just wondered, what was the name of your Company, Mr. Reiff?

A. NW Electric Power Co-op, Incorporated.

Q. And you said at Missouri City?

A. Yes, sir.

CHAIRMAN WILSON: Any questions by members of the Board?

MR. SAMSON: I have none.

CHAIRMAN WILSON: That is all, Mr. Reiff.

(Witness excused)

MR. EDELMAN: Mr. Brandes.

JACK BRANDES,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. EDELMAN:

Q. Will you give your full name and address?

A. Jack Brandes.

CHAIRMAN WILSON: How do you spell the last name?

A. B-r-a-n-d-e-s, 133 South Wheeling, Kansas City, Missouri.

Q. (By Mr. Edelman) Are you the Vice Commodore of the Missouri River Boating Association?

A. Yes, sir, I am.

Q. That is not a paying job, is it?

A. No.

Q. Where does this association have its headquarters?

A. About two miles below the Chouteau Bridge, mile 372 on the river, I believe it is.

Q. That is on the Missouri River?

A. Yes.

Q. How many members do you have in that club, Mr. Brandes?

A. Between 55 and 60.

CHAIRMAN WILSON: How many?

A. 55 and 60.

Q. (By Mr. Edelman) Where do your members live, if you know?

A. Well, in the vicinity of Kansas City.

Q. Do some of them live in Kansas?

A. Yes.

Q. And some of them live in Missouri?

A. That is right.

Q. Do they use the Missouri and Kansas Rivers in their boating?

A. Yes.

Q. Do your members water ski in the Missouri River?

A. Very little of it.

Q. Do you have any opinion as to whether the use of the Missouri River as a boating area is increasing in recent years?

A. Yes, there has been a lot more boats out on it.

Q. Do you think that that is a trend? Do you think boating is going to increase?

A. Why, certainly it is going to increase. It is increasing every year.

MR. EDELMAN: That is all we have, Mr. Chairman.

CHAIRMAN WILSON: Any questions?

MR. KOENIGSDORF: No questions.

CHAIRMAN WILSON: That is all.

(Witness excused)

MR. STEIN: Mr. Britz.

PETE BRITZ,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. STEIN:

Q. Would you state your name and address?

A. Pete Britz.

CHAIRMAN WILSON: How do you spell your last name?

A. B-r-i-t-z. Route 3, Box 250-A, Parkville.

Q. (By Mr. Stein) That is on the Missouri River above the confluence with the Kansas or below?

A. Well, it is above it, but it is slightly to the north of it.

Q. Are you a commercial fisherman?

A. Yes, sir.

Q. Did you ever fish down to the Liberty Bridge?

A. Yes.

Q. Do you go down there now?

A. No.

Q. Why not?

A. Well, it is a stinking mess down there. You put a net in there, a cotton net, if you fish--we used to fish cotton nets and I have some now. You can fish a net down in that country I would say a month and it will fall to pieces, the fish will go through it, where you can take the same net above the Kaw River and fish it for three months. Their acids and the stuff that they are putting in the river will just eat it up.

Q. Are you working as a commercial fisherman part time now?

A. Part time, yes, sir.

Q. If the river were improved would you work there full time?

A. There is nothing I would like any better.

Q. Do you think the condition of this river has been improved since you have been on it?

A. Sir, it is disimproving very rapidly, I would say in the last two or three years it is increasing by the leaps and bounds, the pollution.

Q. Have you ever been down near the Kansas City dump and seen these refrigerators pushed in the river?

A. Sir, I saw from three to five, not refrigerators, they was freezers, some of them, pushed in the river with the gas in it that the water--with a 'dozer--the water boiled up and there was two channel cats that come up from behind one of them dikes with the gills burnt out of them. I saw another fish with the scales completely off of them.

Q. What do you think did that to the scales of the fish?

A. Well, I am no chemist, but I would say that that poison gas from them refrigerators.

Q. Do you mean the refrigerator freezing chemicals?

A. That is what I would say done it.

Q. The refrigerant?

A. Another thing, they lost some cobalt out here at General Hospital and where do you suppose they went hunting for it?

Q. Where did they?

A. They took a Geiger counter to the bank of the Missouri River. That is where they went hunting for their cobalt and they found it in some mop out there later, but they went hunting there, so evidently they must have thought that it went in with some of the other stuff that was dumped in there. I would say they are commercializing, lay their sewers aside, and they get, so I understand, the city gets so much a load for this stuff in order to dispose of it. There used to be bar pits in there and after they was filled up, why, they have got to have that income so in order to dispose of it they just dump it by the bank and push her in the river. That is a good way to do it. For three miles below there it is nothing but refrigerators and cans; you can't put a net in there. If you did you couldn't eat the fish when you caught them.

Q. When you put a net in the Missouri River below its confluence with the Kansas do you ever get anything on your net other than fish?

A. Everything, just anything practically that-- You can take a net and put it in there, go over here now and put it in there, and I doubt if you can wash the stink out of it in a washing machine, I actually doubt that.

Q. Do your boat hulls ever get dirty on the river?

A. My golly, do they? Grease and--I heard these boys--

Q. Does it take much time in cleaning?

A. Well, you clean it, you have got to take it out and paint it every once in a while. If you don't, it will actually eat the wood up. I say north of the Kaw, above the Kaw River, I say there is 100 percent difference than it is below the mouth of the Kaw, and I say if this water, that the amount of pollution that this Kansas City is putting in that river, if there wasn't enough water between here and the intake they had better just pray that this water keeps neutralizing that stuff. If you ever get a low river--now, Bartle come out a year ago and he told the people in Kansas City that this water was just bad vegetation, the river was low and it was just bad vegetation, that there was nothing else wrong with it.

Q. Mr. Britz, did you ever drink any of this water below the confluence with the Kansas River?

A. Well, sir, I will tell you, I was fishing down there, it has been in 1952, I believe, and I had about 300 pounds of fish at that time and I had a--

Q. Can you describe where that was?

A. That was at the foot of North Prospect.

Q. About how far down the Missouri below the mouth of the Kansas is that, how many miles?

A. Well, I am guessing now; I never clocked it. I would say it was approximately where this Paseo Bridge is now.

Q. Yes. All right.

A. I dipped a bucket of water up and set it in the boat. The reason I done that, I knew there was fresh drinking water a little ways from there, but there is a reason for that. If I had left my fish in my net, we have got some scamps down there in those East Bottoms that I wouldn't have had nothing when I come back, so I dipped the water up and when it settled I drunk it and about two weeks later I was in General Hospital with typhoid fever and the records is out there if you would like to check them, I think they should be there. And that is that is the only place I could figure I got it. And I went up on the bank there, I had got this can--now, I don't know whether that river had raised up from that dump and the water got in the can that was in there or I got it out of the river, but I believe I got it out of the river.

Q. Mr. Britz, did you used to on occasion drink water before that time from the river?

A. Yes, sir.

Q. Do you still dip into it to drink?

A. No, sir. No, I don't think you would either after you went through what I did.

MR. STEIN: No further questions.

CHAIRMAN WILSON: Any cross-examination?

CROSS-EXAMINATION

BY MR. POWERS:

Q. Mr. Britz, as I understand, your home is in Parkville?

A. Yes, sir.

Q. And that you were treated at the General Hospital at Kansas City, Missouri?

A. At that time, sir, I was living in Kansas City.

Q. You were living in Kansas City at that time?

A. That was after the flood. I got flooded out at that time.

Q. Did you talk with somebody about this hearing before you came here, with one of the government agents?

A. Well, nobody coached me, if that is what you are looking to.

Q. He told you what it was about, didn't he?

A. Well, Mister, I would like to show you a letter here, or let the Board read it, where I have wrote to Senator Symington in regards to this way before I knew this hearing was going to be. I would like to have these--

Q. Just answer the question I asked you, please. You were told by the government agents what this hearing was about, weren't you?

A. I asked them if Kansas City was going to do anything about it. They says they was going to have a hearing the 13th of June. Well, I said, if there is anything that I could tell the people, I says I want nothing for my time. I gave them time on the river that I never asked a dime for in regards to--

Q. You were given to understand that this was a hearing on sewer pollution, weren't you?

A. Yes, sir, and if there is anything that I could say to retard this, get rid of this-- Do you know we have got human beings below here that is drinking this pollution? I asked one of these guys here, I said, say, I said, this Kansas City council, I says, where did they get their education? Educated people ought to know better than that. How would you like it if I would go and take a bunch of cans and a bunch of trash and dump in your well?

Q. Well, now, that is what I am going to ask you about. Are you saying that these refrigerators and cans and trash come down the sewers?

A. They are dumped in from Kansas City, Missouri, which is paid for dumping them in there. They collect so much from each driver.

Q. You understand that that is with permission of the United States Engineers, because it is outside the harbor?

A. Well, it is a sorry mess, I tell you.

Q. Did you understand that? Did you understand that that is done with the permission of the United States Engineers?

A. Well, I am going to see what I can do about it. You know, one guy is little and he is small, but if he hollers loud enough and long enough somebody is going to hear him.

Q. Now, Mr. Britz, you live in Parkville and why don't you fish in the upper river instead of the lower river?

A. I do. But I am a guy, I like to, you know, come down the river fishing, because the more country you cover at certain times of the year the more fish you catch, you know. These fish aren't traveling at all times. You have got to hit these reefs, if you know what a reef is.

Q. Aren't they traveling up the river?

A. Down the river, sir.

Q. You mean the fishing is better down the river than it is at Parkville?

A. At times. At times these fish congregate in different parts of the river, different parts of the river.

Q. And they congregate more where this pollution is?

A. But I guarantee you they don't stay around the mouth of the Kaw. They come right up through there and they are going miles an hour when they do, what is left of them when they get there.

Q. So you would say the fishing is better below the kaw than above, sir?

A. No, sir, I wouldn't say it. After you catch them what are you going to do with them, man? You can't sell them. You wouldn't want to eat one of them if you saw what is on the net.

Q. I was just trying to get your thought as to why you fish where you--

A. I don't any more. I quit above there. When I hit that Kaw, brother, I am done. I might go down, but that net is not going in the water because it will stink for three days afterwards.

Q. Do you or don't you fish below the Kaw?

A. No, sir, not now. I used to, yes.

MR. POWERS: Thank you.

CHAIRMAN WILSON: Any other questions?

That is all, Mr. Britz.

(Witness excused)

MR. EDELMAN: Mr. Smith.

HAROLD SMITH,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. EDELMAN:

Q. Will you give your name and address for the record, Mr. Smith?

A. My name is Harold Smith and I operate a business at 920 South 7th Street, Kansas City, Kansas.

Q. That business is a bait and fly shop, isn't it, Mr. Smith?

A. Yes, sir.

Q. Are you also an organizer of the Kaw River Boat Club?

A. Yes, sir, I helped organize the Kaw Valley Boating Association and the Heart of America Boating Association.

Q. How long have you been familiar with the Kansas River in the area of Kansas City, Kansas, and Kansas City, Missouri?

A. About 42 years.

Q. Do you think that the condition of the Kansas River in this area has improved or gotten worse over these 42 years?

A. No, sir, it has gotten worse.

Q. Can you describe in what way it has gotten worse?

A. Well, we used to have commercial fishermen on the river a good many years ago and quite a few of them and they are no longer fishing on the Kaw and the river is, I would say, in a real bad shape at present.

Q. Do the members of the boat club boat on the Kansas River?

A. Yes, sir. Right after a heavy rain on the Kaw we have had as many as 80 boaters on a Sunday, but before the rains and the river is pretty polluted we don't have so many, we have anywhere from 25 to 30 boates.

Q. When you talk about the river, is that an area of the river or stretch of the river from the mouth upstream to about how far?

A. Yes, our boaters boat from below the Chouteau Bridge up to about a mile west of the 18th and Kansas Avenue Bridge, what we call the West Kansas Avenue Bridge.

Q. I am unfamiliar with the geography. Is the West Kansas Avenue Bridge on the Kansas River?

A. Yes, sir. Do you want me to show you?

Q. Can you show us by reference to any exhibit? Referring to Government Exhibit No. 13.

A. From a point about 24 on up the Missouri River to the Kaw to about 20.

MR. EDELMAN: Indicating on Exhibit 13 a bridge across the Kansas River with the numerals 20 in red above it. That is right here (indicating).

Q. (By Mr. Edelman) Where does your boat club have a landing in the Kaw River?

A. At the 7th Street landing, 7th and Kaw River.

Q. In your business do you find that your business has been affected by the decline of fishing in this area that you have described?

A. Yes, sir. Before the flood in our business we used to sell on a week end in the neighborhood of 35,000 minnows a week. We don't know that they went to the river or lakes or where they went. Today we are selling about five or six thousand a week. The fishermen on the Kaw before the flood were, I would say, about two to three hundred fishermen a week from the mouth up to past the Turner Village and we don't have five or six fishermen on the Kaw a week today.

Q. When was that flood, in '51?

A. '51, yes, sir.

MR. EDELMAN: That is all we have, Mr. Chairman.

CHAIRMAN WILSON: Any questions?

MR. KOENIGSDORF: I just have one.

CROSS-EXAMINATION

BY MR. KOENIGSDORF:

Q. You say before the flood and after the flood there was a big change in the number of individuals who were fishing on the Kaw or Kansas River. Is there any connection between that date before and after?

A. Yes, there is. I don't know just exactly the dates, but five years before the '51 flood we began to have some trouble with pollution as far as the fisherman and the boater was concerned with the Turkey Creek tunnel--Turkey Creek Sewer that emptied into the Kaw downstream from the Belt Line Bridge. I said a while ago the boaters welcomed the heavy rains before a week end. It washes these sewers out, so to speak, and the debris has gone down and it makes it a little more desirable for the boater to boat and for the fisherman to fish and the river apparently seems to be a little cleaner, it doesn't have so much oil in it and it certainly doesn't have any garbage, which before the flood we used to have a lot. Since then Kansas City, Missouri, I think, has made a change in their way of disposing of the garbage from the city and that sewer since, in the last two years, has not been so bad with garbage and other things that come out of that sewer. We don't have as many fishermen at the mouth of the Turkey Creek from the Argentine and Rosedale side that we used to have before the flood or even right after the flood a couple of years because of the debris. There is some pollution comes down the Kaw above Kansas City, Kansas. We have a lot of it in our city. It has to go some place. We have no other means and I think that our people are ready to do something about pollution in Kansas City, Kansas. Does that answer your question?

Q. Well, except I was trying to find what the difference was before and after the flood, if there was some connection there. You said that Turkey Creek appeared not to carry so much garbage, I think you said, for the last couple of years it has been better, but I was trying to get this before and after the flood, if there was something that happened.

A. Well, to my--

Q. Excuse me just a moment. How long have you lived here?

A. Forty-three years.

Q. Turkey Creek Sewer was constructed around 1920, wasn't it, about that time?

A. '20 or '21.

Q. '20 or 21?

A. Yes, sir.

Q. So it has been there continuously since that time?

A. Yes, sir.

Q. And I was trying to find this before and after the flood, if there was any connection with the flood, anything that happened then?

A. I thought maybe I might have made myself clear. Kansas City, Missouri, had a disposal plant or a hog feeding yard on the Missouri side--on the Kansas side just east of--or west of Genessee, or some such place; I don't know exactly where it was.

Q. I tell you where we got off track. You said the last couple of years and when you said the last couple of years you were going back to the time of the flood, shortly after that that certain things were eliminated, is that right?

A. Yes, sir.

Q. All right. Now, what other type of debris other than these sewage things do you find in the river?

A. We find oil and soap and we don't know exactly what happened here in, I believe it was, '53 but they was something came out of the plants there that we found some hundred fish up on the bank. We thought maybe it might have been a gas or something from even upstream. We don't know exactly where it came from. But we did find a lot of oil on the Kaw in '55, '56 and '57 and we wrote letters to the Santa Fe, to the Rock Island and the American Car Company and asked them if they would help us in trying to keep the Kaw in a cleaner position. They did, they helped us. It got out sometimes, but it wasn't like it was before. In fact, they worked--it was wonderful cooperation, because we had a lot more boaters after we had those letters clarified.

Q. I am going back to the flood again.

A. All right, sir.

Q. I thought we had it clear. Did you say it was worse after the flood?

A. No, it was worse--

Q. Better? Worse before and better afterwards?

A. Yes, sir.

MR. KOENIGSDORF: No further questions.

CHAIRMAN WILSON: Any other questions?

Q. (By Chairman Wilson) Mr. Smith, I think everyone understands it, but you have referred frequently to this stream as the Kaw River. That is the same as the Kansas River, isn't it?

A. Yes, sir.

CHAIRMAN WILSON: That is all.

(Witness excused)

MR. STEIN: I would like to recall Mr. Glen Hopkins to the stand.

MR. SAMSON: Mr. Stein, this is just a point of information, but Dwight Metzler and Jack Smith testified from prepared statements and I was just wondering, as a matter of personal curiosity, are you identifying them as exhibits and introducing them into evidence or aren't you?

MR. STEIN: No. I think they have testified as parties, reprentatives of parties named in the notice of their states, and their statements speak for themselves and speak for these parties.

MR. SAMSON: I just thought it might facilitate the reporter here in her transcript if it was marked as an exhibit. However, you handle the lawsuit as you see fit.

MR. STEIN: We would have no objection to having those entered as government exhibits.

CHAIRMAN WILSON: Well--

MR. STEIN: They were read into the record, though.

CHAIRMAN WILSON: It didn't seem necessary to have them marked as exhibits. It was my understanding that they read their statements and left copies with the reporter. Isn't that true?

(Off the record)

CHAIRMAN WILSON: I think that is a matter for the reporter.

MR. STEIN: All right.

CHAIRMAN WILSON: At any rate, I don't think it would be necessary to have those statements which were read either verbatim or substantially marked as exhibits. The record already shows the contents of their statements.

GLEN J. HOPKINS,

resumed the stand and testified further as follows:

REDIRECT EXAMINATION (Continued)

BY MR. STEIN:

Q. Mr. Hopkins, you will recall you have been previously sworn and are still under oath.

A. Yes.

Q. Mr. Hopkins, you have heard the testimony of various witnesses concerning discharges from sewer outfalls into the Missouri River, the Kansas River and from Turkey Creek Sewer in the Kansas Cities area. I wonder if on the basis of your experience you have familiarized yourself with this information?

A. Yes, I have.

Q. Could you very briefly summarize this type of information concerning discharges from these outfalls in rather large groupings and I wonder if you could pay particular attention to the outfall labeled N-2 and outfalls labeled C-15 to C-20.

MR. SAMSON: N-2 and what other outfalls?

MR. STEIN: C-15 to C-20.

A. I believe the Board has Government Exhibit 14, which lists the sewer outfalls in the F series, the Fairfax Industrial District. Those two names have been used interchangeably throughout this hearing. The industrial district--may I correct myself. The drainage district discharges in excess of twenty million gallons of wastes a day. Basically these are industrial wastes with a minimum of domestic sewage except for the workers in the industry. There is not a resident population. These wastes are important with respect to pollution of the Missouri River because of their large quantity and the nature of the wastes which, for example, contain over 13,000 pounds of chloroform extractable organic materials.

The next division--

CHAIRMAN WILSON: Mr. Hopkins, may I ask you, are you referring to data that is shown on this bunch of tabulations, Exhibit 15?

A. I am summarizing that data and other that has been presented.

CHAIRMAN WILSON: All right.

A. I would like to take next the Armourdale District of Kansas City, Kansas, which is best described as those outlets on the west bank of the Kaw River. Those wastes are large in volume, approximately seventeen million gallons per day, have a high suspended solids and a high BOD population equivalent. They are an important segment of the pollution discharged to the Kansas River.

Next is the Argentine unit identified on Exhibit 14 as the AG series, basically south of the Kansas River within Kansas City, Kansas. These wastes are over a million gallons in volume. The population equivalent exceeds 40,000 on a BOD basis and 15,000 on a suspended solids basis. It is this industrial district down in this part, the lower left part of Exhibit 18. Those wastes, too, contribute to the total pollution of the Kansas River in an appreciable and significant portion.

The Kansas City, Missouri, discharges to the Kansas River, principally that of the Turkey Creek Sewer outlet, the flow of which exceeds seventeen million gallons per day, approximately 118,000 sewered people and approximately 200,000 population equivalents on a suspended solids and BOD basis. That is an important segment of the total pollution to the Kansas River.

With respect to the outlets mentioned, C-15 to C-20, inclusive, those are the outlets of the Kansas City Stockyards Company, part of which is located in Missouri, part of which is in Kansas. The total--

CHAIRMAN WILSON: Excuse me, Mr. Hopkins. I just noticed that a couple of members of the Board have absented themselves temporarily and we do not at this moment have a quorum. I think we--it is nearly noon now and I think we may as well take our noon recess and let's make it until 1:15 p.m.

Just a minute.

MR. POOLE: I am back. I am sorry.

CHAIRMAN WILSON: Well, Mr. Ridge is still absent.

How much of Mr. Hopkins' testimony did you miss?

MR. POOLE: About a minute. He was talking about the Armourdale District when I left.

CHAIRMAN WILSON: Well, the testimony that Mr. Hopkins has been giving has been, as he indicated, a summary of the evidence that is already in evidence on 15, so that now that we have a quorum of the Board and if there is no objection on that account, we will resume and continue.

Go ahead, Mr. Hopkins.

A. Returning to sewer outlets C-15 to 20, inclusive, to the Kansas River, the total discharge of these outlets is approximately 1,600,000 gallons per day, a BOD population equivalent of 6,850, suspended solids population above 14,000, approximately half of which originates within the State of Missouri according to our estimates. This volume of waste must be considered as a substantial contribution to the total pollution of the Kansas River.

The total Kansas City, Missouri, discharges to the Missouri River and to tributary streams below the confluence of the Missouri and Kansas represent approximately 49,000,000 gallons per day, a sewered population in excess of 400,000 and a population equivalent BOD and suspended solids basis of over 500,000.

The other--

MR. SAMSON: Pardon me, Mr. Hopkins. You are going a little fast for me. The 14,000 figure applies to what? Just before your item on the 500,000 population equivalent BOD and suspended solids.

A. Oh, I understand your question now. The suspended solids population equivalent from the sewers C-15 through C-20 estimated at 14,200.

MR. SAMSON: Thank you.

A. The other unit in the metropolitan area, North Kansas City, which is north and east of the river in the loop just near the confluence with the Kansas, has a total flow of approximately 13,000,000 gallons, serving a sewered population of 7,400. One of the discharges here discharge into, located on Government Exhibit No. 16--pardon. That exhibit is not the proper one. Government Exhibit 17. Outlet N-2 is a sewer of North Kansas City, Missouri. It serves approximately one-third of the commercial and residential area of North Kansas City, giving it a sewered population equivalent of somewhere between 2,400-- about 2,400 population equivalents. That in comparison to some of the other sewer discharges is small, but it is still a significant contribution to the Missouri River in the interstate reach between Kansas and Missouri.

MR. SAMSON: You are referring now to what outfall number as indicated on Exhibit 14?

A. N-2, Mr. Samson.

Downstream from the Kansas City Water Plant. I believe that--

CHAIRMAN WILSON: Mr. Hopkins, I don't want to interrupt your testimony, but right on that point it will probably save time if we clear up one matter with reference to this particular outlet. This outlet N-2 is the only sewer outlet from North Kansas City, Missouri, which by any possibility can affect interstate waters, is it not?

A. All other outlets from North Kansas City are below the confluence of the Kansas and Missouri Rivers, yes, sir.

CHAIRMAN WILSON: Now, you in your capacity as regional engineer here, I assume, have had that under observation for some time past?

A. We have known of that outlet. It is included in the consulting engineering reports. Yes, it has come to our knowledge and attention.

CHAIRMAN WILSON: Well, from your observation does the sewage from that outlet mix with the river water to such an extent as to endanger the health or welfare of persons on the opposite side of the channel in Kansas?

A. Under certain conditions of river flow I am of the firm opinion that these wastes can find their way across to the Kansas side of the river and become a part of the total pollution of the Kansas side of the river.

CHAIRMAN WILSON: Would that be, in your opinion, to such an extent as to endanger the health or welfare of persons in Kansas?

A. It would be a contribution to the pollution endangering health and welfare.

CHAIRMAN WILSON: You may proceed.

A. I believe that finishes the summary.

Oh, I have omitted some. Excuse me.

MR. SAMSON: Mr. Hopkins, before you leave that N series, you heard the testimony of Mr. Flassing, who was a witness here on behalf of the government, testify as to outfall N-1.

A. Yes, sir.

MR. SAMSON: And I believe he had observed the condition there in 1957 or 1958.

A. Yes, sir.

MR. SAMSON: What, if anything, do you know about that condition?

A. N-1, to the best of my knowledge, is the waste discharges serving the Kansas City, Missouri, water treatment plant.

MR. SAMSON: What is the nature of that waste, when have you observed it and what effect, if any, does the discharge of that waste, if any, have upon the health and welfare of citizens of Kansas?

A. I have not personally observed the waste discharges of that outlet. They are reported to me to contain silt slurries and similar materials in connection with the pumping and operation of a water treatment plant.

MR. SAMSON: Thank you.

A. I did not mention in my discussion the other public body mentioned in the hearing, the Kaw Valley Drainage District of Kansas. Wastes from the General American Transportation Corporation, a tank car cleaning concern, are discharged to the water course that serves Kansas City, Kansas--or, rather, the sewer AG-7 in Kansas City, Kansas. This is a structure owned and operated by the Kaw Valley Drainage District of Kansas and the wastes of the General American Transportation Corporation enter the Kansas River through this structure of the Kaw Valley Drainage District the same as they do from the structure of other governmental bodies, meaning the sewers.

Q. (By Mr. Stein) Mr. Hopkins, you will recall the testimony of Mr. Pafford of the Corps of Engineers where he spoke about the possibility of the flow in the Missouri being so great that the Kansas River was backed up, and several other people have referred to that. Have you ever been on the Kansas River when that condition prevailed?

A. Yes, I have.

Q. When was this?

A. That was on May 25, 1955, at which time we had made arrangements for the Corps of Engineers' boat to make an inspection trip up the Kansas River. We were accompanied by the mayor, the city manager, director of public works and city health officer of Kansas City, Kansas. The river was so full of sludge--the Kansas River was so full of sludge at the lower mouth at the time that the Corps of Engineers had to do dredging to get the boat into the Kansas River. The entire Kansas River below Turkey Creek Sewer was profusely bubbling with gas from decomposition of sludge. The boat became stuck in the sludge. The propellers were reversed, we finally got out, but we stireed up a pretty good mess in the Kansas River at that time.

Q. I believe you said these were officials of Kansas City, Kansas, is that correct?

A. Kansas City, Missouri. Pardon. I don't believe that Kansas City, Kansas, has a city manager. That was a slip.

Q. That is right. Thank you. Mr. Hopkins, you referred previously to the cooperative treatment works program and objectives of the Missouri Valley states, did you not?

A. Yes.

CHAIRMAN WILSON: Mr. Stein, if you are now entering on another subject matter, I think we will take our recess until 1:30.

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WHEREUPON, the hearing stood at noon recess until the hour of 1:30 o'clock in the afternoon, at which time the following further proceedings were had and entered of record, to-wit:

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AFTERNOON SESSION, THURSDAY, JUNE 16, 1960

SECRETARY AYERS: You have a quorum, Mr. Chairman. Mr. Poole is absent.

CHAIRMAN WILSON: Will he be--

SECRETARY AYERS: He will be here later. He is delayed. You have a quorum.

CHAIRMAN WILSON: The meeting will come to order.

Go ahead, Mr. Stein.

MR. STEIN: Mr. Chairman, due to the storm last night one of the lay witnesses who was scheduled this morning could not appear until this time. He has come at considerable inconvenience to himself and I wonder if he could be put on just to interrupt Mr. Hopkins for a very short time. He will be a very brief witness.

CHAIRMAN WILSON: It is entirely up to you.

MR. STEIN: Mr. Lynn.

RICHARD JAMES LYNN,

called as a witness on behalf of the Government, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. EDELMAN:

Q. Will you give your name and address, Mr. Lynn?

A. Richard James Lynn, 6403 Birmingham Road.

CHAIRMAN WILSON: How do you spell that last name?

A. L-y-n-n.

Q. (By Mr. Edelman) That is in Kansas City, Missouri?

A. Yes, sir.

Q. Are you the owner and operator of a marina?

A. Yes, sir.

Q. What is the name of it?

A. Sharlyn Marina.

Q. Where is it located?

MR. SAMSON: What is the name, please?

A. Sharlyn Marina, S-h-a-r-l-y-n M-a-r-i-n-a.

MR. SAMSON: Thank you, sir.

Q. (By Mr. Edelman) Where is it located?

A. 6403 Birmingham Road.

Q. Is that on the Kansas or the Missouri River?

A. It is on the Missouri River.

Q. Can you tell us approximately where it is located with reference to the Kansas River mouth?

A. About six miles downstream.

Q. About how many boats use your marina?

A. In respect to what length of time, sir?

Q. Can you tell us approximately what the scope of your business operation is?

A. The business of this marina is the first marina in the Kansas City area to induce the Kansas Citians to use the natural resources that we have at disposal so far as aquatic recreation is concerned and we have launching, loading, refueling, repairs, boat service of all kinds at the disposal of the people in this immediate area.

Q. About how many boats can you accommodate?

A. In our storage sheds we can accommodate 75; on our water front facilities we can accommodate 50 at the present time.

Q. You have noticed the condition of the Missouri River near your operation?

A. Yes, sir.

Q. Would you consider that the Missouri River as it presently flows by is a desirable area for boating with respect to its condition, the condition of the waters?

A. No, sir.

Q. Why not?

A. We have an awful lot of foreign material in the water, sewage, it seems like garbage, greases, oils, chemicals, and it is continually collecting on or around the docks, on the hulls of the boats that are put in the water for wet storage, and it is definitely a health hazard.

Q. Do you use floats on your docks with reference to your ramps?

A. We use barrels.

Q. Have you tried to use any other material as a float?

A. When we first went into operation last year we had a fellow down from the company that makes this styrofoam. We thought that would be the most desirable thing to have because of its buoyancy, its ability to withstand rust and rot, and figuring over the long-range program we knew that that would be the ideal thing to make these floats out of. But upon further investigation, through the help of the representative of this company, we tested this Styrofoam in the river and we got a build-up of oils and greases which deteriorated the Styrofoam in a surprisingly short time and we deemed it inadvisable to use this material until something could be done about the river and we were forced to go back to steel drums.

Q. But you would prefer to use the Styrofoam if you could?

A. Definitely.

Q. Have you seen any of your customers water skiing on the Missouri River?

A. Yes, sir.

Q. Do you have any opinion as to the effect a cleanup of the pollution you have described on the Missouri River would have on your business operations?

A. I would conservatively say it would increase it 100 percent.

Q. In other words, it is your opinion that people do not use the river for boating because of the polluted condition you have described?

A. Definitely. I have heard so many people come down and they would like so much to put their boats in the water to puruse aquatic activities, such as aquaplaning and water skiing and various swimming activities, because it is hard for a fellow that works five or six days a week to get in his car and hook his boat up and take it all the way down to the Lake of the Ozarks or these other lakes around here to find decent water to pursue his hobby on. And they will come down to the river and oft-times they will bring their boats down with them and most of the time they will put it in the water and when they pull the boat out of the water it has so much just scum and these foreign particles clinging to the hull of their boat, oils, that it kills it for them. Therefore, they go out of town over the week ends, we lose all that revenue.

Q. What do you think of the possibility of the Kansas River as a water recreation area if that were cleaned up?

A. The Kansas River would be an ideal one. The water there is, as a general rule, placid, the current isn't as swift as it is in the Missouri, it is protected from high winds. It would be an ideal place to pursue whatever aquatic sports one might want to do.

Q. But you would consider it ideal only if the existing condition were cleaned up?

A. Definitely.

MR. EDELMAN: That is all, Mr. Chairman.

CHAIRMAN WILSON: Any questions?

MR. KOENIGSDORF: No questions.

CHAIRMAN WILSON: That is all.

MR. SAMSON: I have on question.

THE WITNESS: Yes, sir.

Q. (By Mr. Samson) How far downstream in miles is your marina located from the confluence of the Kansas River and the Missouri River?

A. About six miles.

MR. SAMSON: That is all. Thank you.

(Witness excused)

MR. STEIN: Mr. Hopkins.

GLEN J. HOPKINS,

resumed the stand and testified further as follows:

REDIRECT EXAMINATION (Continued)

BY MR. STEIN:

Q. Mr. Hopkins, will you briefly summarize the waste discharges and locations from the industries named as parties in the notice of this hearing as you have done for the cities and other public bodies.

A. I would like to follow the sequence of the listing as contained in the notice of the hearing. The Kansas City Stockyards Company was covered this morning through the outlets C-15 through 20.

The Missouri Valley Serum Company is now operated, I understand, under the name of the Bio-Laboratories. Its waste discharges are to the Kansas River through outlet C-8, a flow of about 30,000 gallons per day.

Q. Mr. Hopkins, do you remember the testimony of Mr. Relf, the engineer, referring to a serum company near C-8?

A. Yes.

Q. Would you say that was the serum company he was referring to?

A. That is my opinion.

Q. Will you continue, Mr. Hopkins?

A. Yes. The National Cylinder Gas Company discharges wastes through outlet AM-4 as shown on Exhibit 18-A. The waste data for that discharge has already been given by a representative of the industry; I believe you will remember that it constitutes about one and a half tons of dry solids lime per day.

The National Laboratories Corporation discharges through outlet C-10 in the Central Industrial District of Kansas. Their wastes are estimated at about 40,000 gallons per day, with a population equivalent of about 1,600 both in BOD and suspended solids.

CHAIRMAN WILSON: Excuse me, Mr. Hopkins. If it is your intention to state the population equivalent of these industries, will you go back and do so for the Missouri Valley Serum Company if there is any pollution having a population equivalent?

A. Approximately 400 P.E. BOD.

CHAIRMAN WILSON: Are these figures already stated in Exhibit 15? You needn't repreat them if they are.

A. I don't believe all of them are stated in Exhibit 15.

CHAIRMAN WILSON: Then I think it would be helpful if you would take care to summarize them as you go along. How much did you say for the Missouri Valley Serum?

A. Our estimate is 400 population equivalents BOD.

CHAIRMAN WILSON: Do you have any for the National Cylinder Gas Company or is that entirely on account of the sludge?

A. I would say that is inorganic wastes.

MR. SAMSON: Mr. Hopkins, I have one additional question on C-10. It might be helpful in connection with all of these matters, if you would locate the state in which those industries are situated.

A. All C outlets are in Kansas.

MR. SAMSON: Well, I appreciate that.

A. Yes. I meant to point out that C-10 is in Kansas.

MR. SAMSON: But I mean the connection to the outfall, does that go into Missouri at any place?

A. No, sir.

MR. SAMSON: Very well.

CHAIRMAN WILSON: In the Kansas River.

A. Phillips Petroleum Company--

CHAIRMAN WILSON: Will you state again the population equivalent for the wastes of the National Laboratories?

A. 1,600 both BOD and suspended solids.

Phillips Petroleum Company discharges wastes through outlets F-9, 10 and 11, and is located on the Kansas side of the Missouri River above the confluence of the Kansas River. Their wastes are three and a half million gallons per day. I do not have BOD or suspended solids population equivalents. Their wastes are described as petrochemical in nature and I am sure, as you remember Mr. Metzler's statement yesterday, they will be presented in detail by the industry today.

Procter and Gamble Manufacturing Company discharges through outlets AM-1 and 2, the Armourdale section of Kansas City, Kansas, on the western side of the Kansas River within the State of Kansas. Their wastes are described as in excess of three million gallons per day, population equivalent in suspended solids of above 45,000, and on a BOD basis about 75,000.

The Atchison, Topeka and Santa Fe Railroad Company discharges wastes through various outlets in the Argentine District of Kansas City, Kansas, south of the Kansas River within the State of Kansas and I believe some discharges through Central Industrial District outlets which are on the lower part of the Central Industrial District on the eastern bank of the Kansas River inside the State of Kansas. Their wastes are not large in volume, approximately 200,000 gallons per day, but have a population equivalent of BOD in excess of 20,000.

The Sinclair Refining Company discharges through outlet AG-6 in the Argentine District in Kansas City, Kansas, within the State of Kansas, on the south bank of the Kansas River before it takes it northward sweep to the Missouri River. The wastes from this plant are described as the drainage from the storage tank area. We have no specific data other than readily identifiable petroleum odors have been identified in the drain.

Swift and Company discharges through outlets AM-18 and 19 in the Armourdale District of Kansas City, Kansas, on the east bank of the Kansas River within the State of Kansas. These wastes are large in volume and high in population equivalents, in excess of four million gallons per day in volume, in excess of 200,000 population equivalents both in suspended solids and BOD.

The Midwest Cold Storage and Ice Corporation discharges through AM-8 in the Armourdale section of Kansas City, Kansas, the eastern bank of the Kansas River within the State of Kansas. Their wastes exceed a million gallons per day with a population equivalent suspended solids in excess of 3,000 and a BOD in excess of 8,000.

The Buick-Oldsmobile-Pontiac Assembly Plant discharges wastes through outlet F-3a, which is not on this map, it is up north of the identified Fairfax Industrial District, the waste outlet is I mean. Their wastes have been previously described both by the industry representative and by Mr. Metzler. Their wastes were the lime slurry wastes.

I believe that concludes the list of industries named in the notice.

Q. (By Mr. Stein) Mr. Hopkins, you are aware of the cooperative waste treatment works program and objectives of the Missouri Valley states which were previously referred to in this hearing, are you not?

A. Yes.

Q. What effect would the putting in of remedial facilities in conformity with that program by the parties named in this hearing have in terms of removal of wastes and improvement of river conditions?

A. The objectives of the program for the Missouri Basin states specify the minimum treatment as removal of floating and settleable solids. Coupled with that is the requirement that in the review of plans and specifications for remedial works the state water pollution control agencies having jurisdiction will require either pretreatment or other treatment of wastes that are not susceptible to removal through a primary treatment process before those wastes are discharged to the sewer system. That would minimize such things as blood that would not be effectively removed in a treatment plant or toxic materials that wouldn't be materially removed in a sewage treatment plant.

First with respect to suspended solids, a primary treatment plant built in accordance with the standards of the lower basin states, in my opinion, would remove not less than 65 percent of the suspended solids, by which, coupled with the waste control and waste prevention measures that would be required of the industries, substantially more than 65 percent of the suspended solids now discharged to the river would be eliminated.

With respect to coliform bacteria, as the Board, I am sure, realizes, textbook figures in that vary widely. The reduction is, of course influenced by the design of the plant. Again I refer that the plant built in this area today conforming with state standards would be built to modern designs with proper design factors to effect the upper ranges of efficiency that are possible through this type of a plant. It is my opinion that certainly at least 50 percent of the coliform bacteria would be removed by the process of treatment and by the process of waste control and waste prevention measures that would be affected by the industries to prevent some of these materials from entering the sewer systems. Not only would the coliform bacterias be reduced, but the ones that survived the treatment process would be less well protected than at the present state of discharge. They would be more readily subjected to the unfavorable environment of the stream so that I believe the die-away would be more rapid than now prevails. The total supply of these organisms would, of course, be reduced, which would also tend to improve the--minimizing the coliform content of the receiving waters.

With respect to the chloroform soluble organic materials that have been previously described, some of those would be eliminated while yet capsulated in solid materials and would be settled out before they would have a chance to disintegrate and dissolve. A more substantial reduction would come about through the in-plant prevention and waste control measures for the industrial wastes that are, of course, an important part of the total contributors of this particular type of pollution.

Q. In acquainting yourself with this problem, do you have any idea where the proposed site of the Kansas City, Kansas, plant would be? Would you point? I think Government Exhibit 18.

A. The most recent report by the consulting engineer representing Kansas City, Kansas, proposes a single treatment plant near the junction of the Kansas and Missouri Rivers in the base of the U that is formed by that, by those two rivers. It would be just upstream from the outlet designated as C-8 on Exhibit 18.

Q. Where would the effluent from that plant go, into the Missouri River?

A. The effluent would discharge to the Missouri River.

Q. Would this handle all the waste outlets or substantially all the waste outlets you have on that exhibit in Kansas other than Turkey Creek?

A. The program, of course, includes interceptor sewers along either bank of the Kansas River, with a pumpting station to pumpt from the west bank of the river across to the treatment works. That would take the normal sewage flow from all of the outlets in Kansas, provided the industries join in the city proposed plan, except the Turkey Creek outlet of Kansas City, Missouri.

Q. In other words, this would completely remove all these wastes from the Kansas River, even treated effluent? Nothing would be going in there from these sources you mentioned?

A. I do not believe that that would be completely true until the program of separation of storm and sanitary sewers in Kansas City, Kansas, had been effected.

Q. Dry weather flow it would be, substantially?

A. The vast majority of the time it would be true.

Q. Mr. Hopkins, can you tell what the construction of facilities you have outlined in the entire Kansas City area, what the effect of this would be on taste and odor problems at water plants downstream, such as the Lexington, Boonville, Glasgow plants, and so forth?

A. You say taste and odor problems?

Q. Yes. Would the institution of this program as you have outlined in the Kansas City area tend to decrease the problems they face downstream?

A. This program would substantially minimize the taste and odor problems through the reduction of much of the organic pollution that influences chlorine demand, it would also eliminate much of the chloroform soluble organic materials that contribute to these problems, the water quality would be more uniform, would be able to effect better and more rigid chemical balance, chemical control. I think that taste and odor problems would be substantially minimized.

Q. What effects would this have on the cost, the chlorine costs of these operations of these plants, for example at Lexington?

A. Well, if Lexington is adding in the neighborhood of 100 pounds of chlorine per million gallons, that represents a chlorine cost of about $6 per million gallons. That complete cost would not be eliminated, but it would be substantially reduced. I would be unable to say whether it would be cut in half or further reduced, but it would become a substantial reduction in the cost of operating the water plants as reflected by the cost of chlorine.

Q. Mr. Hopkins, as part of your official duties in carrying out the provisions of the Federal Water Pollution Control Act, particularly Section 4 dealing with research surveys and studies and investigations, Section 6 dealing with construction grants for municipal sewage treatment works, and Section 8 dealing with abatement of interstate pollution, are you responsible for evaluating financial ability of municipalities to construct sewage treatment works?

A. Yes.

Q. Are such cost evaluations part of the training and duties of a professional engineer?

A. Yes.

Q. Are you a registered professional engineer?

A. Yes, I am registered in the State of Missouri.

Q. Have you examined the cost estimates for proposed sewage treatment works for the cities and other public bodies named in the notice of this hearing?

A. Yes.

Q. Would you give us a summary of this examination, Mr. Hopkins?

A. The cost estimate for interceptor sewers, lift stations, for mains and sewage treatment plants to provide for abatement of pollution now discharged through the municipal sewers of Kansas City, Missouri, to the Kansas, Blue and Missouri Rivers, was included in the consulting engineering reports completed by the city in 1958. The firm of Black and Veatch of Kansas City handled that portion of the city south of the river; the firm of Haskins, Riddle and Sharp, also of Kansas City, handled that part north of the Missouri River. Those reports have been submitted as exhibits to the Hearing Board. Those reports visualize that the work, along with additions to the trunk sewer system, would be accomplished in three phases. Each phase would include trunk sewer work in addition to sewage treatment or related work. There has been developed by the consulting engineer a pictorial summation of the work proposals contained in the two reports.

Q. May I have a copy of that?

MR. STEIN: I ask that this be marked Government Exhibit No. 68. It is entitled "Master Plan For Sewerage Facilities, Kansas City, Missouri, Black and Veatch, Consulting Engineers, Kansas City, Missouri, 1960."

(Government's Exhibit No. 68 marked for identification.)

Q. (By Mr. Stein) Mr. Hopkins, is this part of your official records?

A. Yes, it is part of the records of my office.

Q. Mr. Hopkins, are you satisfied that this represents an accurate depiction of the plans covered by these reports?

A. I have checked it as to projects, phase and location, yes.

MR. STEIN: I offer this map as Government Exhibit No. 68.

CHAIRMAN WILSON: Any objection?

Hearing none, it will be received.

(Government's Exhibit No. 68 received in evidence.)

Q. (By Mr. Stein) Will you continue, Mr. Hopkins?

A. On this exhibit you will note three colors. The work in red is phase 1 as proposed in the consulting engineering reports and were designed to meet the immediate needs of Kansas City, both with respect to pollution abatement and trunk sewers. All of the treatment works that would be required to handle all of the city's load as far as pollution abatement is concerned is included in the first phase.

The work proposed for the second phase is shown in green. It consists largely of additions to the trunk sewer system, the principal exception being the provision of a new sewage treatment plant and interceptor in the Birmingham location along the north side of the Missouri River at the eastern side or right-hand side of the map along the Missouri River. Basically stage 2 or phase 2 was designed to meet the needs of a growing city presumably on or about 1970.

Stage 3 would then further expand the facilities to meet the needs of the still growing city, presumably about 1980, both with respect to additional trunk sewers and enlargement of the treatment plants as necessary to provide the population that is estimated to prevail in 1980.

The individual consulting engineers' reports included cost estimates for each of the units of work that are identified on this exhibit.

Q. Have you prepared a summary tabulation of these cost estimates, Mr. Hopkins?

A. Yes, I have.

Q. May I have that?

MR. STEIN: This summary of cost estimates is entitled "Costs of Facilities Required to Treat Sewage and Wastes from Kansas City, Missouri." I ask that this be labeled as Government Exhibit No. 69 for purposes of identification.

(Government's Exhibit No. 69 marked for identification.)

Q. (By Mr. Stein) Did you, Mr. Hopkins, prepare this tabulation yourself?

A. Yes.

Q. From figures from your analyses of the engineering reports and other material?

A. Yes.

MR. STEIN: I ask that this be received in evidence as Government Exhibit No. 69.

CHAIRMAN WILSON: Any objection?

Hearing none, it will be received.

(Government's Exhibit No. 69 received in evidence.)

Q. (By Mr. Stein) Would you proceed, Mr. Hopkins?

A. On the first part of the most recent exhibit the cost of facilities required to treat the sewage and wastes from Kansas City are summarized by stage and by individual unit designation. The cost of all the facilities required to treat the pollution discharged within the city at this time totals, that is a subtotal for stage 1, $16,603,000. I would emphasize at this point that that is in terms of 1958 construction prices.

The addition to the treatment works program that would be required to serve the population visualized for stage 2 would be the interceptor sewer along the north bank and the Birmingham plant at a cost of $7,699,000, again 1958 construction costs.

The third phase or stage of the treatment works program designed to meet the needs of 1980, which would consist of the enlargement primarily of the Blue River plant, would have a total cost of $5,204,000. I would emphasize, however, that when stages 2 and 3 of the treatment works program are needed there will be a larger population to pay for them. In other words, those two stages are built to serve--are visualized to serve future growth of the city.

Now, with respect to the sewer extensions contemplated in the consulting engineers' report, those for the first stage would primarily provide a trunk sewer along the Blue River, an interceptor sewer really--

no, I guess we had better call it a trunk--along the Blue River and a small amount of interceptor sewers in the developing portion of the city north of the river. The total cost, again in 1958 construction prices, for those works is $17,932,000. For stage 2 the interceptors, lift stations, et cetera, shown in green, there would be a cost of $22,429,000. For stage 3, which would be basically the completing of the basic trunk sewer system for the newly annexed portions north of the river, an additional cost of $5,066,000. Making a total cost for trunk sewer additions of $45,427,000.

I emphasize that on treatment all present needs would be met by stage 1. With respect to trunk sewers, some of the trunk sewers that are deferred to stages 2 and even 3 in all probability could be advantageously used by the city at this time, but are delayed to key in with the financing program that was then visualized.

In summary, while the total trunk sewer and sewage treatment program of Kansas City represents a cost of slightly in excess of $75,000,000 in 1958 construction index, the works that are needed to abate existing pollution of the Kansas, Missouri and Blue Rivers from Kansas City, Missouri, represents only $16,603,000 of that total.

The cost estimate for the work in Kansas City, Kansas, is--

Q. Mr. Hopkins, have you prepared a summary table of that cost estimate?

A. Yes.

Q. May I have it, please?

MR. STEIN: I would like to have this marked as Government Exhibit No. 70 for purposes of identification. This is entitled "Cost of Facilities Required to Treat Sewage and Wastes from Kansas City, Kansas."

(Government's Exhibit No. 70 marked for identification.)

Q. (By Mr. Stein) Mr. Hopkins, did you prepare this summary yourself as part of your official duties?

A. I would qualify the word "prepare" it. I extracted it, actually, from consulting engineering reports from the firm representing Kansas City, Kansas.

MR. STEIN: I ask that this be placed in evidence as Government Exhibit No. 70.

CHAIRMAN WILSON: Any objection?

Hearing none, it will be received.

(Government's Exhibit No. 70 received in evidence.)

Q. (By Mr. Stein) Will you proceed, Mr. Hopkins?

A. Yes. The plan in Kansas City, Kansas, as presented in the consulting engineers' report contains various alternate proposals, firm decisions having not yet been made as to which of the alternates will be selected. There will be, I am sure, many factors that enter into that determination.

As in the consulting engineers' report, I have listed the minimum of all possible of those alternates and the maximum of all possible alternates in this tabulation. The estimated cost for the interceptor sewers, lift stations and force mains, depending upon the alternates selected, the minimum alternate would be $9,282,000, the maximum alternate $10,837,000.

Comparably for treatment the minimum alternate--this is the treatment plant--the minimum alternate was $3,918,700, the maximum alternate $5,054,000, giving a total cost for the interceptor sewers and treatment costs some place between $13,200,000 and $15,891,000. To this cost of interceptor sewers, lift stations, force mains and treatment plants must be added a second stage of the Kansas City, Kansas, program also, that is the separation of storm and sanitary sewers, and is estimated to cost $11,000,000 additional.

The Kansas City, Kansas, report is a very recent one, I believe bearing a date of May 1960, and I believe that the cost estimates are completely current. The 1958 reports for Kansas City, Missouri, require some adjustment for the increase in construction costs that have come about since 1958. My estimate of the increase in costs would raise the figure for sewage treatment, including interceptor sewers and related works, from $16,600,000 to $18,100,000. I believe that that would be a fair estimate of the current cost of that work.

Using that cost estimate and the tentative 1960 census population of 468,325, which we all hope will be increased, would give a cost per capita for pollution abatement of $38.65.

MR. POOLE: Is that Kansas City, Missouri, only?

A. Kansas City, Missouri, only.

MR. JOHNSON: And what is that, thirty-eight what?

A. $38.65.

MR. JOHNSON: Thank you.

A. Of course if the sewer service charges or other cost proration is reflected to industry served by the city sewers, this average private citizen per capita cost will be somewhat reduced.

The cost estimates for the Kansas City, Kansas, plan I assumed an average between the maximum and the minimum alternates presented therein and again did not include the separation of storm and sanitary sewers, using for that average between the two extremes $14,546,000, and depending upon alternates selected that figure could be about plus or minus 10 percent.

Using an estimated population of 121,000 for Kansas City, Kansas, and the cost of $14,546,000 gives a per capita cost figure of $121.21 for Kansas City, Kansas. The extensive interceptor sewer program along almost the entire length of the Kansas River along both banks, together with a high industrial load, makes the cost of pollution abatement for Kansas City, Kansas, high on a per capita basis. Again, however, charges to industries within the city will reduce these actual private citizen average costs. And while I would emphasize that the cost of $121.21 per capita seems high, it is to be emphasized that there is still an $11,000,000 storm and sanitary sewer separation program facing the city and I believe the city has also since the program started spent in excess of $3,000,000 getting its program started. The second stage of their program, the eleven million or that already done, the three million, is not included in the figures that I related.

For the Fairfax Drainage District the estimated cost of pollution abatement is contained in the May 1960 report of the firm of Haskins, Riddle and Sharp, consulting engineers representing the city. This estimate is $1,058,000 and includes the interceptor and auxiliary sewers, the lift stations, force mains and the treatment plant to serve the sanitary sewage and industrial wastes discharged to the district sewer system. There would be considerable pretreatment of industrial wastes before discharging to the district system under this plan.

Now, I have already been told that the Fairfax Drainage District is a separate governmental entity, basically an industrial area with only negligible population, which makes per capita cost not data for this specific project.

As a comparison of these costs with other communities, under our construction grants program of Public Law 660, the Public Health Service has detailed construction cost data for the eleven communities in Missouri and the forty communities in Kansas where conventional type sewage treatment plants have been built since July 1, 1957.

Q. (By Mr. Stein) Mr. Hopkins, have you prepared a tabulation of this material?

A. Yes.

Q. May I have it?

MR. STEIN: I ask that this be marked as Government Exhibit No. 71 for purposes of identification. It is entitled "Cost Data Municipal Construction of Conventional Treatment Facilities Contracts July 1957 through May 1960."

(Government's Exhibit No. 71 marked for identification.)

Q. (By Mr. Stein) Did you compile these figures in your office or were they compiled under your supervision and direction, Mr. Hopkins?

A. Under my supervision and direction, yes.

MR. STEIN: I offer this in evidence as Government Exhibit No. 71.

CHAIRMAN WILSON: Any objection?

Hearing none, it will be received.

(Government's Exhibit No. 71 received in evidence.)

Q. (By Mr. Stein) Will you proceed, Mr. Hopkins, in summarizing?

A. Yes. In this summary we included all municipal sewage treatment plants, consisting of sewage treatment interceptor sewers, lift stations and force mains. All other costs were eliminated. Also eliminated were communities where an existing plant was being enlarged or where a community was using the lagoon method of sewage treatment. There are several towns that have used that method of treatment.

For the 40 projects in Kansas serving a 1950 population totaling slightly over 130,000, the average cost per capita of these projects was $67.93. The median of those projects was $98.15. So the cost--

MR. SAMSON: Did you misspeak yourself, Mr. Hopkins, on the average cost per capita?

CHAIRMAN WILSON: I was just going to ask you if you are stating the cost different from that which appears on this exhibit.

A. I am sorry, $68.46.

CHAIRMAN WILSON: The figure on the exhibit is correct, then?

A. Yes, average cost per capita for the Kansas project $68.46. The median $98.15. So the cost at Kansas City, Kansas, would exceed even the median values, but if you will glance at the right-hand column of the table you will find numerous instances where sewage treatment costs have run higher than the $121 that will be required at Kansas City, Kansas.

Q. (By Mr. Stein) Mr. Hopkins, how about the cost for Kansas City, Missouri, is that lower or higher?

A. Well, for the eleven projects in Missouri, a great many of the Missouri projects have used the sewage lagoon, which were excluded from this consideration. The average per capita cost was $71.30 and the median per capita cost was $80.99 as compared to the figure, I believe, of $38.65 for Kansas City, Missouri. If you will glance at the right-hand column of the summary for Kansas City--I mean for Missouri, there is not a single community that has gotten by as cheap as $38.65.

Q. How about, have you analyzed the financial capacity of Kansas City, Missouri, in relation to bearing these costs?

A. Yes.

MR. KOENIGSDORF: I will object to interrogating the witness along this line unless it is shown that he has some basic background or experience and knowledge that would qualify him to testify as to the financial ability of Kansas City, Missouri, to pay for something.

MR. STEIN: I believe that was already done in qualifying Mr. Hopkins as an expert in this field.

MR. KOENIGSDORF: You qualified him as an engineer and I didn't object to engineering costs, but as to city financing I am objecting to him as an expert in that field.

MR. STEIN: Those are part of his duties. I call your attention to the part of the federal act which places as one of the criteria for a federal grant the financial ability of the party. In other words, priority for federal grants are given on the basis of financial and well as water pollution control needs. Again I call attention to the duties and trainings of professional engineers who take this into account in providing cost estimates, fee schedules, and so forth, in preparing plans for municipal sewage treatment works. I think this is fairly well accepted.

MR. KOENIGSDORF: Mr. Chairman, you can't by federal act make Mr. Hopkins an expert on the finances of cities. I have the highest regard for Mr. Hopkins as an engineer. I am sure that he is well qualified in all phases of engineering. But this is a different matter and if we are going into city financing, I don't believe he has been qualified. Maybe he can be, but it is my opinion he has not been qualified as an expert. Therefore, I make my objection.

CHAIRMAN WILSON: Well, of course any evidence of this kind received by the Board would be considered in the light of the qualifications of the witness, but I do not recall that any qualifications to make a financial analysis of the financial status of a municipality have been established as to Mr. Hopkins. If you wish to inquire of him further and lay a foundation for that, Mr. Stein, you may do so.

Q. (By Mr. Stein) Mr. Hopkins, have you made financial analyses of municipalities in the past as part of your work?

A. I have done financial analyses to meet the requirements of programs of the Public Health Service in which I am engaged.

Q. Have official actions of the Public Health Service been taken on the basis of these analyses you have made?

A. Yes.

Q. Would you describe briefly how you might make one of these analyses?

A. There is considerable data that is available to guide judgment in these matters, for example the matter of assessed valuation, that bears a relation to bonding capacity, the salability of bonds and similar aspects of financial matters.

CHAIRMAN WILSON: Mr. Hopkins, are you familiar with the methods that are followed by financial experts in making such financial analyses?

A. Generally.

CHAIRMAN WILSON: And in making your analysis with reference to these cities have you substantially followed those methods?

A. I believe so.

CHAIRMAN WILSON: And you have done so in previous cases in connection with your duties?

A. Yes, sir.

CHAIRMAN WILSON: You may answer the question.

MR. KOENIGSDORF: I would like to renew the objection. Whether he is familiar with the methods of financial experts is not the test as to whether he is an expert, so I would like to renew the objection.

CHAIRMAN WILSON: It will be taken subject to the objection.

A. As I mentioned, assessed valuation is one index of the total problem of economic feasibility. Kansas City, Missouri, has a 1958 assessment of real property of $559,350,960. A pollution abatement cost of $18,100,000 represents approximately 3.3 percent of the real property assessed valuation of Kansas City, Missouri. That is an unusually favorable ratio.

Kansas City, Kansas, had a 1958 assessment of total tangible property of $96,611,965. A pollution abatement cost of $13,200,000 is approximately 13.6 percent of the tangible property assessment of Kansas City, Kansas. While this is much higher than the ratio for Kansas City, Missouri, it is still not an unfavorable ratio.

The Fairfax Drainage District had a 1957 tangible property assessment of $23,553,170. A pollution abatement cost of $1,058,000 is less than four percent of the tangible property assessment. This is a very favorable ratio.

Current indebtedness for water and sewers is also a factor of economic feasibility. Bond ratings are influenced, among other things, by valuation, outstanding debts, the size of the project and other factors. Kansas City, Missouri, has slightly over $3,000,000 outstanding in general obligation bonds for sewers, slightly over $3,000,000 outstanding in the general obligation bonds for water, and slightly over $34,000,000 in outstanding water revenue bonds, for a total bonded debt for water and sewerage of $40,601,000. Additional bonds of $18,100,000 for pollution abatement would increase indebtedness for water and sewers to $58,701,000, less than 10 percent of the assessed valuation of the city.

Kansas City, Kansas, has $4,294,000 in outstanding debt for sewers and $9,150,000 in bonds for water and electric plant revenues. Allocating all of this $13,444,000 debt to water and sewers, in other words excepting the electric plant indebtedness, is less than 14 percent of the tangible property assessment. The abatement program at Kansas City, Kansas, as I have previously described, would almost double that indebtedness.

The Fairfax Drainage District is listed with a gross debt of $108,000 as of July 1, 1958. The cost of pollution abatement would constitute an indebtedness of about four and a half percent of the assessed valuation of the Fairfax Drainage District. Revenue bonds in both Kansas Cities are rated by standard rating authorities as Double A, meaning the bonds are of high quality as judged by all standards. The assessed valuation and bonded indebtedness data and the bond rating as just described are taken from the latest volume of Moody's Goverment Manual which we normally depend upon in matters of this kind.

It is my considered professional judgment that sewage treatment will involve no unreasonable financial burden for Kansas City, Missouri, for the Fairfax Drainage District or for Kansas City, Kansas.

Q. (By Mr. Stein) Mr. Hopkins, you have heard considerable discussion of the waters of Turkey Creek Sewer, the Kansas River, and the Missouri River in and near and below the Kansas Cities Metropolitan Area. Do you consider these waters as being polluted?

A. Without question.

Q. Do you regard the persons names in the notice of this hearing discharging wastes in the various outfalls named, previously referred to in this hearing, as causing or contributing to such pollution?

A. I do.

MR. STEIN: No further questions.

However, before we complete, the regulations governing the hearings require or ask that we make recommendations of the Surgeon General concerning remedial action. Now, we would prefer that Mr. Hopkins make these recommendations now so he could be subject to cross-examination by counsel for all the parties involved and by the Board rather than making them at the end of the hearing. If it is agreeable, we think it generally is more acceptable if Mr. Hopkins would make these recommendations now.

CHAIRMAN WILSON: These are recommendations that have already been made, are they not?

MR. STEIN: No, sir. If you look at the regulations governing the hearing, section--

CHAIRMAN WILSON: Oh, you are not referring, then, to those that were involved in any previous conferences?

MR. STEIN: No, sir. Section 81.9 of the regulations say, "The Surgeon General shall arrange for the presentation of evidence concerning the pollution, the person or persons discharging any matter causing or contributing to the pollution, and remedial measures, if any, recommended by him." Now, we do have these recommendations and we would like to make them now to give counsel a chance to cross-examine.

MR. KOENIGSDORF: Mr. Chairman, I am a little confused. It seems to me as though those are no part of testimony or evidence. Is that correct, sir?

CHAIRMAN WILSON: No, they are simply what the regulations call for.

MR. KOENIGSDORF: And so for that reason I can see no reason why the parties named would want to cross-examine on them. They are not in evidence. They are a submission by the government after the close of the case. I can see no reason why we should have them now. We are just talking about Mr. Hopkins' testimony at this time.

MR. STEIN: These are not recommended findings.

MR. KOENIGSDORF: Are they evidence?

MR. ELSON: You say these are or are not?

MR. STEIN: Are not.

MR. ELSON: Are not?

MR. STEIN: Not necessarily. What it involves here is a recommended time schedule for remedial action. Now, if you would want it-- Customarily the counsel prefer to have the opportunity to cross-examine on this. We have concluded the major portion of the government's case and we would like to make this available to the Board at this time.

CHAIRMAN WILSON: I think in view of the regulation that counsel for the government has the complete discretion whether or not to offer these recommendations at this time or not. As I understand, your position is you are as a matter of courtesy indicating to counsel for the cities that if they would prefer not to have them offered at this time but to defer them until after they get through with the cross-examination of this witness, you will so defer them?

MR. STEIN: We have so many counsel representing various groups that I think on the basis of past hearings we have found it more acceptable to offer them at this time so as to give counsel for all parties an opportunity to examine them and not put them in at the close of the hearing, and we would like to offer them at this time.

CHAIRMAN WILSON: If you wish to offer them at this time, you may proceed.

Q. (By Mr. Stein) Mr. Hopkins--

MR. SAMSON: Mr. Stein, before you get into that I have one or two questions that I would like to ask Mr. Hopkins.

In connection with the Kaw Valley Drainage District of Kansas, did I understand your testimony to be that that party merely furnishes a vehicle by which some other party transports pollutants into the Kansas River?

A. Certain wastes enter the Kansas River through a structure owned by the Kaw Valley Drainage District. The Drainage District does not in itself produce waste, but these wastes are conveyed to the river through structures owned by the district.

MR. SAMSON: I see. Is that party that is using that vehicle a party to this action?

A. No, sir.

MR. SAMSON: Where are they located, in Kansas or in Missouri?

A. In Kansas.

MR. SAMSON: And I believe you mentioned the name of the company, but I didn't make a note of it.

A. It escapes me at the moment. I will find it in just a minute.

The General American Transportation Corporation.

CHAIRMAN WILSON: Well, in short, Mr. Hopkins, the drainage district there is in a position comparable to that of an ordinary municipality that accepts industrial wastes in its sewers?

A. Yes, sir.

CHAIRMAN WILSON: It doesn't produce the waste itself, but it becomes responsible for the discharge of that waste because it allows their discharge through its sewers?

A. Yes, sir.

MR. SAMSON: I have no further questions. Thank you.

Q. (By Mr. Stein) Would you proceed, Mr. Hopkins--

MR. BRENNEISEN: Mr. Chairman, as I understand it, you are going to read the recommendations?

MR. STEIN: Mr. Hopkins will read them.

MR. BRENNEISEN: Read the recommendations. I thought it was being introduced as an exhibit. Are they being introduced as an exhibit?

MR. STEIN: No, they are not being introduced as an exhibit.

MR. BRENNEISEN: Would there be an opportunity, since he says Mr. Hopkins will be subject to our cross-examination on these recommendations, would there be an opportunity for us to have them maybe ten or fifteen minutes so we could go over them and then have a chance to cross-examine Mr. Hopkins on them?

CHAIRMAN WILSON: Certainly, you may have all the opportunity to study them that you need. I do not know whether additional copies are available, but--

MR. STEIN: We do not have any copies, but we will be happy to call Mr. Hopkins back to the stand at any time for questioning on this.

CHAIRMAN WILSON: With that understanding, you may proceed. We are arranging to have copies made and they will be available.

Just one minute.

MR. ELSON: I have only one question procedurally. Is Mr. Hopkins going to be available for cross-examination on the testimony that has been given after this has been introduced or are we to cross-examine him now?

CHAIRMAN WILSON: Oh, definitely he will be available.

MR. ELSON: After. On the prior testimony?

CHAIRMAN WILSON: Certainly. Certainly.

Q. (By Mr. Stein) Go ahead.

A. In accordance with 42 Code of Federal Regulations 819, and as the representative at this hearing of the Surgeon General of the Public Health Service, I am authorized to recommend that:

1. The City of Kansas City, Missouri, the Fairfax Drainage District of Kansas, the Kaw Valley Drainage District of Kansas, the City of Kansas City, Kansas, and the firms named in the notice of this hearing construct and place in operation proper, adequate and effective municipal and industrial waste collection, treatment and disposal facilities as necessary to abate pollution of the interstate waters of the Missouri River in accordance with the schedule hereinafter set forth.

2. On or before September 1, 1960, each such firm desiring to be served by a public sewerage system shall advise the owners of such public system of the volume and character of sewage and industrial and other wastes it proposes to discharge to the public system.

3. On or before December 1, 1960, each city or other public body named in the notice of this hearing shall complete the arrangements for the financing of such remedial works, including the holding of a successful bond election if required for the financing of the remedial measures.

4. On or before January 1, 1961, each city or other public body named in the notice of this hearing shall in writing instruct its engineer to proceed with final plans and specifications for proper, adequate and effective treatment facilities for the sewage and industrial and other wastes to be disposed of through the public system. If such action is not taken by the city or other public body or if such instruction does not provide for service to industry as covered in step 2 hereof, such industries shall initiate detailed planning for their own remedial facilities not later than January 31, 1961.

5. On or before January 1, 1962, final plans and specifications for such remedial facility shall be completed and submitted to the state water pollution control agency having jurisdiction for review and approval.

6. On or before July 1, 1962, all such remedial works shall be placed under contract for construction, to be completed and placed in operation within a reasonable time.

7. Within 15 days after each date established in this schedule each city or other public body and each firm engaged in any industry involved in this hearing shall advise the regional engineer, Region VI, United States Public Health Service, as to progress towards compliance with each step of this schedule applicable to it.

That concludes it.

Q. Mr. Hopkins, in conformance with the notice of the hearing, did you intend here to say the interstate waters of the Turkey Creek Sewer and the Missouri River?

A. Yes. That is an omission. May I reread step 1 of this proposed schedule?

Q. Would you do that?

A. "The City of Kansas City, Missouri, the Fairfax Drainage District of Kansas, the Kaw Valley Drainage District of Kansas, the City of Kansas City, Kansas, and the firms named in the notice of this hearing construct and place in operation proper, adequate and effective municipal and industrial wastes collection, treatment and disposal facilities as necessary to abate pollution of the interstate waters of Turkey Creek Sewer and of the Missouri River in accordance with the schedule hereinafter set forth."

MR. STEIN: We have no further questions of Mr. Hopkins.

MR. BRENNEISEN: Read 3 again.

Q. (By Mr. Stein) Would you mind reading 3 again?

A. "On or before December 1, 1960, each city or other public body named in the notice of this hearing shall complete the arrangements for the financing of such remedial works, including the holding of a successful bond election if required for the financing of the remedial measures."

CHAIRMAN WILSON: I may say for the information of counsel that I have just been informed by the Secretary that copies of these recommendations just read by Mr. Hopkins are being made and will be distributed as soon as available. However, in order to save time perhaps we could--if the government is through--

MR. STEIN: Yes, we have concluded.

CHAIRMAN WILSON: --with the presentation of this witness, counsel for other parties may proceed with their cross-examination.

MR. KOENIGSDORF: Thank you.

CHAIRMAN WILSON: And perhaps you would like to defer your cross-examination on these recommendations until you get copies.

MR. KOENIGSDORF: That was not part of the evidence? That was outside of the evidence?

CHAIRMAN WILSON: No, that was merely part of the material required under the regulations to be submitted to the hearing. The witness is speaking as a representative of the Surgeon General in submitting these recommendations.

MR. KOENIGSDORF: Thank you, Mr. Chairman.

RECROSS-EXAMINATION

BY MR. KOENIGSDORF:

Q. Mr. Hopkins, in your testimony at the very beginning you stated that, if I understood you correctly, Kansas City, Missouri, discharges through Turkey Creek into the Kansas River seventeen million gallons per day?

A. I believe that is correct. I can find my notes on that in just a minute. I believe I said 17.48 million gallons.

Q. How much of that is contributed from residents of Kansas?

A. According to my figures, .72 million gallons.

Q. The next figure that I believe you gave was 118,000 and what was that based on?

A. Sewered population.

Q. How much of that is from Kansas?

A. According to my figures 15,000.

Q. 200,000 is the next figure I have and I think that is on BOD, is it not?

A. BOD population equivalent, I believe I--

Q. Also for solids and BOD?

A. I believe in both cases I said approximately 200,000.

Q. Now, the same question as to how much of that is contributed by residents of Kansas.

A. The actual figure is 206,000 BOD population equivalents, of which 8,250 are estimated to originate in Kansas. For suspended solids the total discharged is 199,900 population equivalents, of which 9,150 is estimated to originate in Kansas.

Q. Is it your idea that Kansas City, Missouri, will furnish full treatment for those sewage disposals?

A. I think that--

Q. Or treatment? I don't care whether full treatment; whatever treatment.

A. In my analysis I believe I followed the same reasoning that the consulting engineers followed, that it would be reasonable for that waste to be treated in the Kansas City, Missouri, plant, that there probably would be other instances where reciprocity would prevail, and that the contractual arrangement would be worked out to provide equitable financing. As I mentioned, among the various alternates of the Kansas City, Kansas, proposal I think that one of those alternates provides for taking those wastes out at the state line. It is something that has not yet been worked out and I would not want to recommend whether each city proceeded to handle their share of that problem individually or through concerted action.

Q. If Kansas City, Kansas, and Kansas City, Missouri, can't agree, then what do we do?

A. If you can't agree, you disagree.

Q. I am being serious about the fact that we have a problem here and I wondered if you took that into consideration?

A. It is a very small part of the total discharge. The additional size that would need be incorporated in the Turkey Creek plant to handle this waste would add very little to the cost of the plant. I believe that it would be to the financial advantage of both cities to handle it in one plant with a fair contractual arrangement. If that agreement cannot be reached, I am sure it would be a legal problem, probably going back to the original contract under which this facility was constructed, and I am not prepared to say how it should be resolved.

Q. I said you were a good engineer. We have got a lot of law in that engineer, haven't we?

A. I am sure you will take care of that, Dick.

Q. Thank you. Were you, Mr. Hopkins, ever notified by the State Board of Missouri that they had considered a resolution on June 1, 1960, which was offered by Kansas City, Missouri, setting up certain target dates for the construction of sewage treatment facilities?

A. As a direct answer to your question, no, I was not advised. I was there at the time and I was provided a copy of the minutes of their meeting, so in effect I was advised.

Q. You were provided with a copy of the minutes with resolutation attached?

A. Yes.

Q. So you knew that the State Board of Health had on June 1, 1960, adopted or accepted a time schedule which was submitted by Kansas City, Missouri, to the State Pollution Board of Missouri?

A. Their resolution covering the matter was in the minutes. I did not interpret it as an approval. I interpreted it as a recognition that it was a plan, it would abate this pollution, and therefore they would take no action in the way of orders or other approaches at that particular time, and that whenever the sewer service charges were actually in effect certain sanctions, as they were called, would be restricted. It was an acceptance, not an approval.

Q. Except for the sanctions, I think you have answered the question, you stated that no further action was to be taken by the State Board of Missouri in view of the resolution and plan which was presented to them. Does that not constitute acceptance of that proposed plan?

A. I believe the Board would have to answer that for you. I gave you my interpretation.

Q. Well, the Board, I thought, did answer and I didn't know you had a different interpretation. Do you know Mr. Stanley Palmer?

A. Yes.

Q. He is the engineer of Kansas City, Missouri?

A. City engineer, yes.

Q. You came up with figures of eighteen million something on the original treatment.

A. Eighteen one.

Q. I think you will find that the exhibit that Kansas City introduced on the pay-as-you-go plan uses figures somewhat in that area, I think it has the 1958 figures in fact. You revised those figures up to eighteen million one and he was asked to stand on such figures. He said that it was not possible to tie it down to an exact amount. Would that be right or wrong, sir?

A. I believe the estimate is as accurate as can be made. I merely projected the 1958 estimate to today's construction cost index.

Q. In the figures we are talking about a couple dollars one way or the other may not be much, but the figure that we have used generally was twenty million and that he said he thought he could stand by as a figure, regardless of these things that happen. When you go into a contract you find there are other expenses that you had and you find, as you already indicated, that your cost each year has gone up. He figured approximately twenty million and I just wondered if that isn't within reason?

A. Yes, the cost increase for the next four years, which would be the principal part of your pay-as-you-go plan, the Blue River plant, the four-

and six-year periods, the cost increase in that alone would be appreciable. I would not quarrel with your twenty million dollar figure.

BY MR. POWERS:

Q. Mr. Hopkins, on the question of your familiarity with municipal finance, especially with reference to Kansas City, what is the constitutional debt limit of Kansas City?

A. I cannot say.

Q. You do not know?

A. No, sir. I didn't even check, not considering that this matter would approach it.

Q. Well, do you know how many bonds have been issued by Kansas City which are applicable to its debt limit?

A. Only as reflected in Moody's Government Manual, the source of information that I used.

Q. And what is that figure?

A. In water and sewage I believe--

Q. No, I am talking about total bond issues, general obligation bond issues outstanding.

A. I did not check the figure except as related to water and sewage.

Q. Do you know the amount of bonds that are authorized and unissued by Kansas City, Missouri, general obligation bonds?

A. No, sir.

Q. Do you know the margin of debt limit above the bonds that are now payable?

A. No, sir.

Q. And accordingly you do not know the legal debt margin which we still have to issue new bonds?

A. Are you speaking of revenue bonds or general obligation bonds?

Q. General obligation bonds.

A. No, sir, I did not consider that sewage treatment would be financed by general obligation bonds. That would be extremely unusual in Missouri.

Q. Well, in any event, you haven't examined very carefully the financial structure of Kansas City, have you?

A. I do not believe that the examination that I gave would be reflected as a detailed, expert financial analysis, no, sir.

MR. POWERS: The city renews its motion that the testimony of the witness respecting the ability of the city to finance these works be stricken out.

CHAIRMAN WILSON: Motion denied. The evidence may stand subject to the previous objections and comments.

MR. KOENIGSDORF: No further questions.

CHAIRMAN WILSON: Any other counsel?

RECROSS-EXAMINATION

BY MR. ELSON:

Q. Mr. Hopkins, on I believe it is Government Exhibit 71, which is your tabulation on the per capita cost of these recent sewage plants in Missouri and Kansas, it would appear that there is no plant in Missouri serving a population of 10,000 or more which had a cost per capita any higher than $63.10, approximately one-half of the figure that you projected for Kansas City, Kansas, is that correct?

A. That is a correct interpretation of the data on this exhibit.

Q. And similarly with respect to Missouri, you come out at about the same point. The only city involved that was over 8,600 was a cost per capita of $64.43, once more roughly about half of the projected Kansas City, Kansas, figure?

A. Yes, sir.

Q. Is it not a fact that the cost of a treatment plant in a small community, let alone communities in the range of 269 and 326, is completely out of relation to the cost in a larger-sized community?

A. The per capita cost in a small community for a small project is usually considerably higher than for a large project. This tabulation and analysis wasn't intended to reflect that particular aspect of sewage treatment construction costs. It was intended to reflect, rather, an ability to pay. While the cost of $121 per capita in Kansas or $38 in Missouri is considered high, the vast majority of communities in the state have already paid about that for this type of service. Cities can and do raise that much money per capita for improvements of this type.

Q. Do you have an opinion, based on your experience, that the ability to pay per capita would be as great in a large metropolitan center as it would be in a smaller rural community?

A. I think there is very much information that would indicate that, average incomes, so forth.

MR. ELSON: That is all I have. Thank you.

CHAIRMAN WILSON: Any other questions by counsel?

Members of the Board? Any questions, gentlemen?

That is all, Mr. Hopkins.

Oh, say, just a minute.

Q. (By Chairman Wilson) A question occurred to me just a moment ago in reference to a question by one of the counsel in regard to the handling of this Turkey Creek problem which crosses the state line, and Mr. Hopkins indicated that it could be solved by some kind of joint action between the communities.

A. This relates back to the Turkey Creek here at this part of the state line (indicating) rather than this one (indicating).

Q. Yes, I understand.

A. I just wanted to point out that the costs of handling these wastes would only reflect in the treatment plant in its operation, not in the interceptor sewers and other works. I think that it is one of the situations that invite cooperation among the two parties having interest and I am feeling that it will either be worked out through negotiation to the satisfaction of both parties or, if not, it could be diverted from this point (indicating) back into some other sewers through the construction of a lift station or it could resolve itself into a legal argument.

Q. Yes, sir. But what I have in mind wasn't directed to that point. I understood you perfectly on what you have just said. But it suggested to me to ask you in reference to this entire problem of these two adjacent cities whether the consulting engineers or your office had ever given consideration to whether or not it would be more economical for these two cities to join in a single system for dealing with the entire problem than in separate systems divided by the state line?

A. There have been many people and many agencies that have given thought to that possibility, Mr. Chairman. There have been bills introduced into the legislatures of both states to set up a type of an authority that could handle the matter as a single agency. It passed in one state but died in the legislative halls in the other state. Planning commissions and agencies have studied it. There are certain aspects that do lend themselves to cooperation on a metropolitan area approach. One of the things, unfortunately, that has held this back is the readiness of two or more of the communities to proceed at a certain time. I am not sure that in the absence of specific authority through the state legislatures that a metropolitan area could be used for this problem.

Q. At any rate, the possibilities of that approach have been considered?

A. They have been considered by engineers, planners, and to some extent by the political bodies. When you use the word "fully", that is difficult to answer.

Q. No, I didn't say fully considered or I didn't mean to. I meant that some thought had been given to them.

A. Yes.

Q. In view of the fact that similar problems have been handled that way elsewhere, it occurred to me that it would be strange indeed if that possibility had not been considered. Now I just want to ask you as an engineer one further question. In recognition of the very great legal difficulties in the way of forming a joint agency to deal with this problem, it wouldn't be justified unless there would be a very substantial saving, in other words it might be better to go ahead separately as seems to be planned now than to attempt to go to all the trouble and take all the time that would be required for the creation of a joint agency. Would you say as an engineer that there would be a possibility of a very substantial saving by a joint enterprise as compared with the cost estimates that you have given us for the plans now under consideration for a separate approach?

A. I do not believe the savings would be truly substantial, no, sir. I might explain that. To take the full advantage of a metropolitan area approach would mean extending some of these interceptor sewers over long distances and the increase in the size of those interceptor sewers pumping facilities probably would increase the cost more than would result through the savings in treatment plants.

Q. Well, I can understand that. Now referring to another point in this Exhibit 8, the master plan for the sewerage facilities, the plan apparently contemplates, if I interpret it correctly, that the sewage now going from Kansas City, Missouri, out through the Turkey Creek outlet will be carried through an interceptor sewer to a treatment plant entirely in Kansas City, Missouri, is that correct?

A. I am afraid I did not follow your question, Mr. Wilson.

Q. Well, I will ask you the direct question. Under this new plan how will Kansas City, Missouri, handle and treat the sewage that now flows into the Kansas River through the Turkey Creek outlet?

A. May I use Exhibit 18 to illustrate my answer? The consulting engineers' report for Kansas City, Missouri, and I believe the Palmer pay-as-you-go plan for Kansas City, Missouri, visualized a sewage treatment plant right on Turkey Creek here at the junction of the Kansas River. In addition these wastes that discharge to the Missouri River just below the confluence of the Kansas and Missouri Rivers, but within the State of Missouri, would be pumped back to this plant. These are small outlets and would be pumped back here (indicating), because a small interceptor would carry them, whereby it would take a tremendously large interceptor to take the wastes from Turkey Creek down to the Missouri River.

Q. Oh, well, then I misunderstood this line for an interceptor that is shown on the plan. The sewage would be running in the opposite direction from what I understood. In other words, Kansas City, Missouri, would build a treatment plant near the present outlet of the Turkey Creek Sewer--

A. Yes.

Q. --and would there treat the sewage that now flows through that as well as additional sewage to be diverted from the northern part of the city?

A. That is the engineering plan.

CHAIRMAN WILSON: That is all.

MR. JOHNSON: May I ask one question?

CHAIRMAN WILSON: Go ahead.

Q. (By Mr. Johnson) Glen, I would like to know on this particular exhibit, does this take in the most recently annexed area too?

A. I believe this does. I would like to check that with my friend, Mr. Koenigsdorf. I think this takes all current annexations.

MR. JOHNSON: That is what I wanted to know.

CHAIRMAN WILSON: Any other questions?

MR. SAMSON: I just have one on general observation.

Q. (By Mr. Samson) Mr. Hopkins, are you aware of any statement or any position of the city council or the City of Kansas City, Missouri, as to what their attitude would be or the feeling would be in the event that this bond issue that we have heard so much about failed as it concerns stream pollution?

A. The Board would not invite hearsay testimony, would it, Mr. Samson? By that I mean I have---

MR. KOENIGSDORF: Mr. Chairman, I think maybe that public discussion and creating an opinion right now by someone might adversely affect the possibility of passage or---I don't know how it would react. It might be unfavorable, it might be favorable, but I think it is rather touchy ground to get upon. If you want the answer---

MR. SAMSON: All right.

A. Let me give another answer which I think would better cover. I have not discussed the matter with the city.

CHAIRMAN WILSON: Mr. Samson withdraws the question.

Copies of the recommendations submitted by Mr. Hopkins are now available?

SECRETARY AYERS: I have copies for everybody except the Board.

CHAIRMAN WILSON: Furnish the counsel for the city with copies and counsel may examine them now. As long as everyone seems to be through with Mr. Hopkins on other phases of his testimony, if counsel for Kansas City, Missouri, has any questions on these recommendations he may proceed.

SECRETARY AYERS: Don't you want to take a recess about this time, Mr. Chairman?

MR. ELSON: May we take a recess?

CHAIRMAN WILSON: Yes, at this time we will take a recess for twenty minutes in order to give you an opportunity to examine this.

(RECESS)

CHAIRMAN WILSON: The hearing will come to order. Mr. Hopkins, will you take the stand again, please?

Do any counsel wish to examine Mr. Hopkins in reference to the recommendations for the construction program?

MR. BRENNEISEN: Yes.

RECROSS-EXAMINATION

BY MR. BRENNEISEN:

Q. Mr. Hopkins, referring to your schedule No. 2, have you taken into consideration there the complex problems facing industry and the City of Kansas City, Kansas, in reaching a decision of whether or not they are going to discharge their wastes through the sewer system of Kansas City, Kansas, or whether or not they are going to construct their own sewage treatment plants, problems such as submitting their plans if they are constructing their own plant to the State Board of Health and getting its approval and considering the costs of treating their own sewage through their own plant and the cost of treating their sewage through the city plant?

A. Yes, I did consider that element.

Q. Do you still think that is plenty of time for that to give all those considerations and come to a conclusion?

A. Keeping in mind that this matter has been under consideration for quite some time and that much of the work is already done, I believe that the date is a reasonable one.

Q. I notice that you have nothing in there about a notice from the industries to the city in case they do not intend to discharge their wastes through the public system. Don't you think that there should be something to the effect that they should notify the city if they do not intend to discharge their wastes through the public sewer system?

A. It was my intent that the responsibility would be on the industry. If they wanted service through the system of the public body they would have to make that desire known in writing.

Q. Don't you think it would weaken the position of the city if the industries did not also notify the city if they did not intend to discharge their sewage through the city, that is we would be uncertain until we heard one way or another?

A. It was my opinion, as I viewed it, that failure of any industry to meet this schedule would be accepted as prima facie evidence by the city that the industry did not desire to be served by the city system. Maybe I--

Q. Wouldn't we be put in somewhat the position of a man proposing, until he gets a yes or no answer he is going to be up in the air?

A. I have no real definite opinion. It seemed to me that the responsibility should be tied in one place and that the proper place to tie it was with the industry concerned.

Q. Referring to No. 3, let's see, shall complete arrangements for the financing. Would you consider a successful bond election as completing the arrangements for financing?

A. A successful election?

Q. Yes.

A. Yes.

Q. I don't suppose you have any suggestions as to how to hold a successful bond election? You want the Board to order us to hold a successful bond election?

A. No, I believe the approach that your city is taking is much better than that.

Q. I think I would--

A. I would like to take this opportunity to commend your action of getting the charges in full force and effect before you hold the election so that then you are not voting to raise charges, you are only voting to use those to sell your bonds to go ahead with your program. Costs aren't going to be increased.

Q. In your recommendation No. 3, have you considered the possibility, and of course it is always a possibility, I don't think it will happen, but have you considered the possibility that our bond election will not be successful and that we will have to go to the legislature in January if it is not successful and ask for authority to issue bonds without an election? Have you considered that in setting out this December 1st date?

A. Frankly, no. That would be a precedent in the State of Kansas, a matter of legislation to provide a new method of financing. No, I had not considered that possibility.

Q. I suppose this is argumentative and I will talk about it later. We are not happy with the date or we are not happy about the schedule No. 5 at all. That is a matter of argument. I will take it up later. Now, In

No. 6 or before July 1, 1962, all such remedial works shall be placed under contract. I take it for granted that under 6 and as explained under No. 1 you are referring to phase No. 1 of our program and not the complete operation of storm and sanitary sewage?

A. You are correct. I did not include the eleven million dollar separation cost.

MR. BRENNEISEN: All right, sir. No further questions.

CHAIRMAN WILSON: Questions by any other counsel? Do you have any, Mr. Koenigsdorf?

MR. KOENIGSDORF: No, sir.

CHAIRMAN WILSON: Any other counsel?

MR. ELSON: I have just one question, Mr. Hopkins.

RECROSS-EXAMINATION

BY MR. ELSON:

Q. How does this schedule, particularly item 6 as the date for which the remedial works shall be under contract, compare to the schedules that have been adopted by the Secretary of Health, Education and Welfare upstream on the Missouri River, Sioux City, St. Joe, and so forth?

A. I think generally they are very comparable dating from the time of the hearing. Sioux City was supposed--

Q. I may not have made my question clear. I am not thinking in terms of time intervals between financing, planning, under contract and completion. I am thinking of absolute dates. On July 1, 1962, does everybody else upstream have to be under contract for remedial works?

A. In advance of that date, yes.

MR. ELSON: Thank you.

I have one more question.

Q. (By Mr. Elson) A matter of information and clarification. In item No. 1, and it doesn't affect us directly but just trying to understand, what is meant by the interstate waters of Turkey Creek Sewer?

A. The interstate waters of the Turkey Creek Sewer in fact relates to Turkey Creek Sewer which, in my opinion, is in itself interstate waters.

Q. I am not familiar with the physical nature of Turkey Creek Sewer except from the outfall slides we saw the other day it looked like a concrete box structure. Is that true farther on through Kansas?

A. It is not a concrete box structure as it goes back into Kansas up here, although the concrete box prevails over most of the area. Actually

Turkey Creek as a drainage way no longer exists. The big sewer has been laid down in the old creek bed, so to speak, that has been filled over and is not a developed area. So the sewer is, in fact, the drainage way, receives both storm water and sewage.

Q. So it is the government's position, I take it, that Turkey Creek Sewer in Kansas where it discharges into the Kansas River and for its entire distance from the point of discharge in the State of Kansas until it reaches the State of Missouri, although it is a concrete or other structure, is considered by the government to be an interstate water?

A. Turkey Creek Sewer, is my interpretation.

CHAIRMAN WILSON: Any other question?

MR. ELSON: Supported by government counsel, I assume?

MR. EDELMAN: Yes.

MR. KOENIGSDORF: Mr. Chairman, I hope it is understood that by not cross-examining on this that Kansas City, Missouri, does not agree to the dates that were proposed, but this was not evidence as Mr. Hopkins' proposal and I see no reason for us to cross-examine.

CHAIRMAN WILSON: It may be so understood.

Are we all through with Mr. Hopkins now?

MR. STEIN: Yes, we are.

MR. MURPHY: Mr. Hopkins.

MR. SAMSON: Mr. Murphy has a question.

CHAIRMAN WILSON: Oh.

RECROSS-EXAMINATION

BY MR. MURPHY:

Q. Just for personal information, just for a matter of personal interest. In your recommendation do you make any differentiation between the disposal of sanitary waste and sanitary sewage for an industry? What I am driving at, suppose a bond election in a city fails, even though they may have the best of intentions. You have postulated here that each industry that is listed shall set up its own sewage disposal plant. Do you mean that you are going to have dozens and dozens of these plants in each state for both sanitary and industrial wastes?

A. Would the industry which is the basis of your question be included in step No. 2, in other words desiring to be served by the public system?

Q. Yes.

A. Then I think the industry becomes included in the city system until such time as it is shown that the city system is not going forward.

Q. What happens, though, if the city system can't go forward, they can't raise the money to build it with by a bond issue?

A. Are those wastes now being discharged through an industry-owned outlet?

Q. I imagine in some instances they may be.

A. Then I think that would still be an industry responsibility.

Q. That answers my question. How about the sanitary waste, that all goes into city system?

A. If the wastes now go into the city system, the responsibility would rest with the city system owning the sewers which receive the wastes.

Q. All right. Then you don't contemplate that in the contingency that I mentioned, the city's failure to build a treatment plant, that industry will have to build its own separate sanitary treatment plant?

A. You ask for my contemplation. I contemplate that the cities will build these plants without any real problem. That is my contemplation.

Q. That the cities will build them?

A. Yes.

MR. MURPHY: Well, I was just wondering what happened if they didn't?

MR. ELSON: Keep your eye on St. Joe.

MR. MURPHY: I think that is sound advice.

CHAIRMAN WILSON: Everyone through with Mr. Hopkins now?

That is all, Mr. Hopkins.

(Witness excused)

CHAIRMAN WILSON: Now, before you proceed to another step, I would like to ask for the estimates of counsel for all parties as to how much more time will now be required. How about the government, Mr. Stein? How much more time are you going to need for both evidence and argument?

MR. STEIN: We need no more time for evidence. We will have a closing argument of approximately five minutes and depending on closing argument, if any, of other counsel we may need more time for rebuttal. We can't ascertain the time for rebuttal until we hear the argument of other counsel, if any.

CHAIRMAN WILSON: How about Kansas City, Missouri, Mr. Koenigsdorf, how much time do you think you will need?

MR. KOENIGSDORF: We are going to have, depending upon whether we have any problems--I don't think so, I have talked to counsel--a couple of things to introduce into evidence which might clarify the picture, a little time for argument and that will be it. We don't expect to call any witnesses.

CHAIRMAN WILSON: How about Kansas City, Kansas?

MR. BRENNEISEN: I expect it will take us from fifteen to thirty minutes to introduce evidence and I expect five minutes in argument.

CHAIRMAN WILSON: May I see a show of hands as to how many industries there are that will wish to present evidence or statements?

There seem to be about ten or twelve. Thank you.

If there is any industry that considers it will take them over fifteen minutes, will you kindly raise your hands?

We have already had a request for a very brief appearance in behalf of one of the drainage districts before we go further. And with the permission of counsel we are going to grant that request shortly. Will any other drainage district want any considerable amount of time?

Now, it is very close to 4 o'clock. In view of what has just been said, does it seem possible that if we stretch the session this afternoon a little longer we might get through before 6 o'clock? Would everybody be agreeable to do that?

MR. KOENIGSDORF: Whatever time it takes, Mr. Chairman, we want to use. Now, I don't want to be tied down to a time and I don't know what is going to happen. We have to cooperate, but I think the matter is serious enough that we want to take all the time we have to to protect the client.

MR. JOHNSON: You would work a little later than 5, though?

MR. KOENIGSDORF: Yes.

CHAIRMAN WILSON: If we could conclude the evidence today and perhaps some of the arguments, then if it were necessary we could close the hearing fairly early tomorrow forenoon and that would get us through in ample time to wind this entire matter up to permit the Board to go into session and make its findings and recommendations this week.

Well, I will ask counsel, in view of that, whether they feel that it would be at all desirable to hold an evening session this evening or perhaps run a little over 5 o'clock and get as much done as we can tonight with the idea of letting the arguments go until tomorrow morning? We could do that.

Well, we will see how we come out. How about the Board? How do you feel about it?

MR. SALOME: You know my attitude on that, Mr. Chairman. We are here to work, some of us from further distance than others.

CHAIRMAN WILSON: But it is quite evident that we are going to be unable to--

MR. SALOME: It is quite evident to me that if we are intending to and wish to that we can finish this evening on our testimony and the final arguments and go into session tomorrow morning and finish our job and then we won't stay over tomorrow night. And I think that is fully acceptable, we stay as late as necessary tomorrow night.

CHAIRMAN WILSON: That seems to be quite possible.

MR. RIDGE: I would think that a session this evening, I don't think we can finish before 5, but I think a session this evening would be perfectly proper.

CHAIRMAN WILSON: We will see how we come out when we get there.

Now, we have a request from the engineer of one of the drainage districts and I understand that counsel have no objection, so you may come forward and put in your statement now.

Be sworn, please.

CLIFFORD SHARP,

called as a witness on behalf of the Fairfax Drainage District, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY CHAIRMAN WILSON:

Q. Give the reporter and the Board your full name, address and position, please.

A. My name is Clifford Sharp, partner in the engineering firm of Haskins, Riddle and Sharp. We are consulting engineers for the Fairfax Drainage District.

Q. Is the district represented by an attorney here at this time?

A. Not at this time, sir. They have another little matter across the river where the attorney is.

Q. But, at any rate, you are appearing here--

A. There is an annexation problem on the other side, sir.

Q. You are appearing as their representative?

A. Yes, sir.

Q. And you wish to make a statement?

A. Yes, sir, if I may.

Q. Are you reading from a written prepared statement?

A. Yes, sir.

Q. Can you leave a copy with the reporter?

A. Yes, sir.

Q. If you should depart from that prepared statement, you will please indicate so that the reporter won't have to take it verbatim unless you should interpolate something.

A. Yes, sir.

Q. Go ahead.

A. The Fairfax Drainage District owns and operates the sewers in the district. This district is predominantly industrial in nature, and the sewers are of the combined type for the most part.

Studies have been made upon the volume, strength and characteristics of the sewage being presently discharged from the district's system into the Missouri River above the mouth of the Kansas River. Also studies and cost estimates have been made for treatment facilities. The results of these studies are set forth in detail in two reports, copies of which have been previously submitted to the Kansas State Board of Health and two copies each of which are herewith submitted to you.

CHAIRMAN WILSON: Right there, Mr. Sharp, let the Secretary mark the original of this bunch of copies as Fairfax Drainage District's Exhibit 1.

Q. (By Chairman Wilson) You don't propose to read that report, do you?

A. No, sir. I have to write it. You read it.

SECRETARY AYERS: Let me get it straight, Mr. Chairman. You say two copies of one or what?

A. Two copies of each. There are two reports and there are two copies of each, sir. One is dated in June of '59 and one May 1960.

Q. (By Chairman Wilson) Oh, then you have two reports there to submit?

A. Yes, sir, and two copies of each one.

CHAIRMAN WILSON: Let the first one be marked Drainage District Exhibit No. 1 and the other one Drainage District Exhibit No. 2.

(Fairfax Drainage District's Exhibits No. 1 and 2 marked for identification.)

Q. (By Chairman Wilson) These are reports prepared by your engineering firm?

A. Yes, sir.

Q. On the sewage and waste disposal problems of the district?

A. Right, sir.

Q. And you offer them in evidence?

A. Yes, sir.

CHAIRMAN WILSON: Is there any objection?

They will be received.

(Fairfax Drainage District's Exhibits Nos. 1 and 2 received in evidence.)

A. Thank you.

Q. (By Chairman Wilson) Proceed with your statement.

A. The district is now in the process of evaluating the different possibilities presented, prior to holding conferences with various interested parties. After these conferences are completed, a final determination will be made regarding the type, capacity and location of the facilities to be constructed.

The district's present schedule, which has been approved by the Kansas State Board of Health, contemplates the submission of detail plans and specifications to the Kansas State Board of Health by January 1, 1961; the award of construction contracts by March 1, 1961; and completion of construction by July 1, 1962.

That is it.

Q. Does that complete your statement?

A. That is all, yes, sir.

CHAIRMAN WILSON: Any cross-examination?

Members of the Board?

Q. (By Mr. Samson) I think in order to clear up the record here, would you please look at Exhibit No. 14, Government Exhibit No. 14, and clear the record up on the matter of the Fairfax Industrial District. Is that the same in that geographical setup, is that generally the same and corresponds with the Fairfax Drainage District?

A. Geographically, yes, sir. There are some little minor variations, but for all practical intents and purposes it is one and the same area.

Q. Generally in Exhibit 14 where it is indicated as Fairfax Industrial District, that is one and the same as the Fairfax Drainage District?

A. Yes, sir. I would like to point out one thing, however. The Fairfax Drainage District in itself has only one outlet going into the river that is discharging contaminants.

Q. Would you indicate which one of those F series that that is, if you know?

A. I don't know what their coding is here. It is the Jersey Creek outlet, is all I know.

MR. STEIN: F-7.

MR. SAMSON: That is all my questions.

A. It would be F-7, sir.

MR. SAMSON: That is all. Thank you.

CHAIRMAN WILSON: Just a minute, Mr. Sharp.

Q. (By Chairman Wilson) The Fairfax Drainage District is a governmental unit organized under the laws of the State of Kansas, is it not?

A. Correct, sir.

Q. And this designation on Exhibit 14, Fairfax Industrial District, apparently was put on there simply to describe that area, not as the name of any corporation or governmental unit?

A. Fairfax Industrial District is just an area, that is all.

CHAIRMAN WILSON: That is all.

Do we understand that the government rests?

MR. STEIN: Yes.

CHAIRMAN WILSON: Very well.

MR. KOENIGSDORF: For the purpose of the record, Mr. Chairman, Kansas City, Missouri, reiterates the objections constitutional and otherwise that were made at the commencement of the hearing where it states that in the opinion of Kansas City, Missouri, the government has failed to substantiate the burden of proof and produce the proof necessary to substantiate the charges that have been made against Kansas City, Missouri. Further Kansas City states that the Kansas River is not such a river as comes within the jurisdiction of the act.

For all of these reasons, Kansas City, Missouri, respectfully requests that Kansas City be dismissed as a party in this proceeding.

CHAIRMAN WILSON: Motion denied and any objections implied therein are overruled.

MR. KOENIGSDORF: May I proceed?

CHAIRMAN WILSON: Proceed.

MR. KOENIGSDORF: Thank you.

For the purpose of clearing the record, this morning I made a statement that revenue bonds--I don't know how important this is, but I want to clear it up-- of short duration were not salable and I have found since that that statement was not accurate. It has not been the custom or practice in Kansas City to issue such. We have three major revenue bond issues outstanding that I can think of offhand, this would be the Mid Continent Airport, the Broadway Bridge and the Auditorium Plaza Parking for our Municipal Auditorium. All of those are thirty-year bonds; that is the customary term of years that Kansas City has used for large projects.

A member of the Commission asked that information be furnished as to the interest costs on financing a revenue bond issue of twenty million dollars. I instructed our finance department to prepare a sheet showing such and it is based upon our ordinary term of thirty years. Of course you can adjust it any way that you so wish, but as a basis to start on such has been prepared and I will ask that this be identified. I believe it is Kansas City's--

SECRETARY AYERS: No. 2

MR. KOENIGSDORF: --Exhibit No. 3

SECRETARY AYERS: Oh, No. 3?

MR. JOHNSON: Yes.

MR. KOENIGSDORF: Yes. Kansas City, Missouri, Exhibit No. 3.

SECRETARY AYERS: Yes.

(Kansas City, Missouri, Exhibit
No. 3 marked for identification)

MR. KOENIGSDORF: I hold in my hand Kansas City, Missouri, Exhibit No. 3, which I think is nothing but a mathematical calculation showing revenue bond costs, term of thirty years, principal amount thirty million dollars, estimated interest rate four and a half percent, total cost on the twenty million dollar bond issue on thirty-year period would be $16,845.300.

CHAIRMAN WILSON: Any objection?

MR. STEIN: We would like to examine this first.

No objection.

CHAIRMAN WILSON: There being no ojection, the exhibit will be received.

(Kansas City, Missouri, Exhibit
No. 3 received in evidence.)

MR. KOENIGSDORF: Will you mark these, please, as one? There are several documents in there.

SECRETARY AYERS: How do you want them marked?

MR. KOENIGSDORF: They all pertain to one subject. Let's mark them 4, 4-A and 4-B, et cetera.

MR. SAMSON: Mr. Koenigsdorf, on Exhibit 3 on that interest rate is that high or low or is that about right?

MR. KOENIGSDORF: That is within the range of revenue bonds at this time. They may vary a little bit down or a little bit up. Within a period of six months it can go to five percent or it is conceivable it could go down to four, they vary that much, but that I think is a reasonable figure to take. Is that correct, sir?

MR. RIDGE: It is not too much too high.

MR. JOHNSON: I don't think it is high.

MR. SAMSON: I don't know.

MR. RIDGE: For tax free, it is not too bad.

Mr. Chairman, may I say this, that it is not responsive to the question I asked, however.

MR. KOENIGSDORF: I am sorry. What was the question?

MR. RIDGE: The difference between the interest cost between three and six years.

MR. KOENIGSDORF: I am sorry, I didn't understand that to be your question. I suppose you could break this down, though, proportionately to show interest for a smaller period of time.

MR. RIDGE: I can, yes.

SECRETARY AYERS: 4, 4-A, B and C.

(Kansas City, Missouri, Exhibit No. 4,
including 4-A to 4-C, inclusive, marked
for identification.)

MR. KOENIGSDORF: I hold in my hand now Kansas City, Missouri Exhibits 4, 4-A, 4-B and 4-C. These are exact copies of the official records of Kansas City, Missouri, having to do with the agreement between Kansas City, Kansas, and Kansas City, Missouri, and the Kaw Valley Drainage District as to the Turkey Creek Sewer, maintenance, operation, and so forth. I certainly didn't want to keep anything from the record. Maybe this will explain the legal problems or show you how we are presently operating and on what basis.

The Exhibit 4 is the ordinance of Kansas City, Missouri, dated September--let's make it approved September 24, 1918. At that time we had an upper house and a lower house and have two dates.

Exhibit 4-A is the agreement between the City of Kansas City, Kansas, and the City of Kansas City, Missouri.

Exhibit 4-B is the agreement between the Kaw Valley Drainage District and Kansas City, Missouri.

Exhibit 4-C is an ordinance providing for a contract extending the time to begin and complete work on Turkey Creek Sewer. And this is dated the 11th day of July 1919.

MR. SAMSON: Mr. Koenigsdorf, you raised the question on the ownership of that project. What information do you have on the ownership of it?

MR. KOENIGSDORF: I will get it from that.

MR. SAMSON: Fine.

MR. STEIN: No objection.

CHAIRMAN WILSON: Received.

(Kansas City, Missouri, Exhibit No. 4,
including 4-A to 4-C, inclusive,
received in evidence.)

MR. KOENIGSDORF: Mr. Samson asked for an interpretation of the document. I can see some legal problems, but the document does provide that Kansas City, Missouri, would construct the sewer and maintain and operate this sewer. There is nothing, of course, provided in the way of treatment as a sewer line. It was contemplated and was constructed with permission granted to Kansas City, Kansas, to hook into this sewer at their discretion either within or without the State of Kansas, that is they could hook in either in Kansas or in Missouri, and they would, however, first submit the plans to the engineer of the City of Kansas City, Missouri.

That basically is my understanding of the contents. Mr. Brenneisen has seen it. I don't know if he agrees or disagrees. We are not arguing the contract. That is just my conclusion as to what it states very briefly.

MR. SAMSON: Thank you.

MR. KOENIGSDORF: Of course the document speaks for itself, but that was just maybe a little resume that might be helpful.

The City of Kansas City, Missouri, has nothing further.

CHAIRMAN WILSON: Kansas City, Kansas?

MR. BRENNEISEN: Yes, sir, I have a statement to make and I will take the stand.

C. W. BRENNEISEN, JR.,

called as a witness on behalf of the City of Kansas City, Kansas, being first duly sworn, testified as follows:

DIRECT TESTIMONY

THE WITNESS: My name is C. W. Brenneisen, Jr. I live in Kansas City, Kansas, and I am city attorney of Kansas City, Kansas.

When we think of water pollution by the City of Kansas City, Kansas, we are considering a city with a population of 130,000 and a metropolitan area of 1,250,000. We are considering the conversion of five old combination sanitary and storm sewers into one modern system intercepting the many outfalls separating the storm and sanitary sewage and treatment.

We are considering--

CHAIRMAN WILSON: Do you have a statement, Mr. Bremneisen, that you can give us?

THE WITNESS: My statement has been shortened since yesterday without the help of a stenographer.

CHAIRMAN WILSON: Okay. Perhaps you had better read it, then.

THE WITNESS: It has been chopped up.

We are considering a project costing approximately twenty-six and a half million dollars for a city with a tax base of 96,000,000. As a result of a 1950 Kansas State Board of Health order, the City of Kansas City, Kansas, retained a consulting engineering firm for the purpose of making an engineering report on sewer separation, sewage collection and sewage treatment for the entire city. This report was completed in 1953, and it is in the evidence here as Government Exhibit No. 3.

In 1954 Kansas City, Kansas, approved a bond election for $3,700,000 for sewer purposes. Sewers have since been constructed using this money.

Approximately $2,500,000 of this money was for purely interceptor sewers that went for pollution purposes. Approximately a million dollars of this was for storm sewers. The storm sewers, of course, will be necessary when we separate the sanitary and storm sewers.

I might say that in this bond election the local Chamber of Commerce and our local industry backed up the election and we carried it by six to one.

In 1958 the city hired a consulting engineer to bring the 1953 preliminary sewer engineering report up to date. This engineering report has been completed and was formally filed with the city on the 2nd day of June 1960. This has also been introduced as a government exhibit, Government Exhibit No. 4.

In 1958 the city contracted with a consulting engineer to prepare construction plans and specifications to bring about sewer separation and sewage treatment in Kansas City, Kansas.

In the spring of 1959 the city, together with the Chamber of Commerce, lobbied a necessary bill in the state legislature to give municipalities in Kansas authority to plan, construct, reconstruct, operate and maintain complete sewage disposal systems to be financed by sewer service charges and/or revenue bonds and to give municipalities authority to contract with any firm, person or other municipality in or out of the state for sewage disposal.

In 1959 the city caused an extensive sewer service rate study to be made. This rate study includes not only proposed charges but also a complete cost accounting system for fixed costs and operation and maintenance costs of sewage treatment.

A citizens committee composed of representatives of all phases of residential, commercial and industrial development was appointed by the Board of Commissioners in 1959. This committee reviewed the sewer service rate study report in detail and after such study recommended that the Board of City Commissioners adopt the report's recommendations. This recommendation was not unanimous and we still have hearings scheduled for the city on our service rates.

The city held meetings with the Chamber of Commerce and industrial companies to study and review the rate study. The city has instructed its legal department to prepare for a bond election to be held in November of 1960, said election to approve the issuance of revenue bonds for the constructing, operating and maintaining of sewer and sewer treatment system. The bond election is definitely scheduled for November of this year.

For the past year our consulting engineer has been continuously measuring flow and sampling for laboratory analysis of the many city and other domestic and industrial outlets to the Kansas and Missouri Rivers in Kansas. We have made over 1,800 separate laboratory analyses. The primary objective was to obtain data for design purposes on the complex waste that must be treated. An equally important result has also been obtained as each of the large industries has been notified on three separate occasions of the exact strength and volume of its waste discharged.

In December of 1959 the City of Kansas City, Kansas, was cited before the State Board of Health to show cause why the permit to discharge sewage should not be revoked. At this hearing the city committed itself to have a bond election in November of 1960 to begin construction plan preparations for all phases, including a treatment plant by January 1, 1960, and to have the treatment plant under construction by July 1, 1962, or in step with other municipalities in the metropolitan area.

The city water and light plant is operated by the Board of Public Utilities, a separate governmental entity from the city. We have discussed our problem with this Board and have a general commitment from the

Board of Public Utilities to bill sewer service charges through the business office of the Board of Public Utilities. After due study the Board of City Commissioners adopted the following construction program recommended by the Revised Report of Sewage Collection and Treatment for Kansas City, Kansas.

Phase 1. To consist of the interceptors, pumping stations, force mains and treatment plant necessary to intercept and treat sanitary sewage.

Phase 2. To consist of the main and trunk sewers necessary to separate storm and sanitary sewage flow.

The construction of phase 1 to be initiated as soon as funds are available in order to spread contract lettings over as long a period as practical and thus facilitate financing this major program.

We have held conferences with other municipalities in the metropolitan area for the purpose of determining whether or not it was feasible to dispose of their sewage through the system of Kansas City, Kansas. A complete water pollution abatement ordinance was introduced in April of 1960. The city has held many conferences with industry, Chamber of Commerce and other parties for discussions of the ordinance and the sewer service charge rates set out in the ordinance. As a result of these conferences, the city has the ordinance in the form it intends to pass, with the exception of the service rates. The city has advised industry that they will be given another opportunity for hearing before the final passage of the ordinance and the fixing of these rates.

I wonder if you would mark this Kansas City, Kansas, Exhibit No. 1, I suppose.

(Kansas City, Kansas, Exhibit No. 1
marked for identification.)

THE WITNESS: At this time I offer for introduction Kansas City, Kansas, Exhibit No. 1, which is a water pollution ordinance. I have offered it to the attorneys and they have seen it.

CHAIRMAN WILSON: Is this an existing ordinance or a proposed ordinance?

THE WITNESS: This is an ordinance that has been put on first reading. It has not been passed. Under our procedure we have to put an ordinance on first reading and then pass it on second reading and publish it before it is adopted. This has not been adopted.

CHAIRMAN WILSON: Any objection?

Hearing none, it will be received.

(Kansas City, Kansas, Exhibit No. 1
received in evidence.)

THE WITNESS: One of the recommendations of the consulting engineer in the revised report was the construction of the Turkey Creek interceptor sewer.

Now, that has nothing to do with this Turkey Creek. This on out of town here, it is not part of this, it is part of our sewer system, but we call it the Turkey Creek interceptor sewer.

An ordinance was introduced on the 2nd day of June 1960 and passed on the 7th day of June 1960 instructing the city engineer and the consulting eingeer to file a survey and description of the needed right-of-way for this sewer. Under our statutory procedure this is the first step in condemning right-of-way for this sewer, which is one of the interceptor sewers outlined in the revised report.

We do have a very serious problem in Kansas City, Kansas. We are competing with other municipalities in our metropolitan area for industry and business. The maintenance of our present industry and business and the obtaining of new industry and business is the life blood of Kansas City, Kansas. This is a very competitive field in our metropolitan area. It is necessary that we maintain a healthy climate for business and industry in the city limits of Kansas City, Kansas. Any type of tax or sewer charge out of proportion with other municipalities in our area could upset seriously our economic structure. With these facts in mind, the city commissioners feel that the city should stay in step with but not far in advance of other municipalities in the metropolitan area in the financing of water pollution abatement.

Now, our consulting engineer will be on the stand in case you want to ask him any technical questions about our construction phase. That is all I have.

CHAIRMAN WILSON: Have you finished your statement, Mr. Brenneisen?

THE WITNESS: Yes, sir.

CHAIRMAN WILSON: Any questions?

Members of the Board?

That is all.

THE WITNESS: It has been called to my attention that I misstated a date and it may be important. I said in here that the city committed itself to begin construction plan preparations--is that where?--yes, I said that we committed ourselves to begin construction plan preparations for all phases, including the treatment plant, by January 1, 1960. I should have said 1961.

MR. POOLE: I have a question, Mr. Chairman.

CHAIRMAN WILSON: Very well.

Q. (By Mr. Poole) If I made my notes right, the Kansas State Board of Health order was to place the plant under construction by July 1962, is that correct?

A. I believe that is true, yes.

Q. That is only six months difference from the January 1962 date which was in Mr. Hopkins' proposed schedule for the Surgeon General and I thought I heard you indicate when we were discussing that that--

A. We were not concerned with the date under construction. We were concerned with the date of having the plans ready and our engineer, I will ask him to discuss that with you.

Q. Well, it is a fair question for me to ask you, then, you are not necessarily concerned with either the January or July '62 date for the start of construction on the treatment plant?

A. No, we are not concerned with the date on starting the construction. We think the date of No. 5, we should have more time on No. 5.

Q. Well, No. 5 is in mine on or before January 1, 1962.

A. To have final plans and specifications.

MR. POOLE: Oh, I see. You are correct; I was wrong. 6 is July 1962 start construction.

(Witness excused)

MR. BRENNEISEN: Will you take the stand.

CARL HODGKINSON,

called as a witness on behalf of the City of Kansas City, Kansas, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. BRENNEISEN:

Q. Your name is Carl Hodgkinson?

A. Yes, sir.

Q. Please state where you live?

A. 7016 Woodson, Overland Park, Kansas.

Q. Do you have a B.S. Degree in Civil Engineering from the Oklahoma State University and an M. S. Degree in Sanitary Engineering from the University of California?

A. Yes, sir.

Q. You have had three years' experience in the U. S. Public Health Service?

A. Yes, sir.

Q. Will you explain very briefly what that experience has been?

A. I was a staff engineer in the Upper Mississippi and Western Great Lakes Drainage Basin office in water pollution control.

Q. You have had five years' experience with the Kansas State Board of Health and will you explain very briefly what that has been.

A. Initially I was district engineer in the Dodge City district, where I was responsible for an annual inspection and a report as well as assisting operators in that district. Then I became chief of the water pollution control section for the State Board of Health in Topeka, where I was responsible for the water pollution control program.

Q. You have been with Truman Schlup, consulting engineer, for the last two years?

A. Yes, sir.

Q. State very briefly your responsibilities with this engineering firm.

A. I direct sanitary design.

Q. Now, Mr. Hodgkinson, will you describe very briefly the existing sewer system of Kansas City, Kansas, considering other evidence that this Board has already heard about that system?

A. May I use the government exhibit?

Q. Yes.

A. Maybe it would be faster to do it on the map. I forget the number of that.

MR. EDELMAN: 13.

MR. STEIN: 13

A. This is Exhibit No. 13 and I will try to correlate this where these photographs are applicable, because I think this might be more visible.

Initially the sewer systems in Kansas City, Kansas, belonged to five different municipal governments and as a result there are five separate systems. There is a system in the northern part for an area up in here (indicating), a system in the central part for this area in here (indicating), the Armourdale system which is this area down in the flood plain west (indicating), and the Argentine system, which is on the south and west bank of the Kaw River (indicating), which is just out of the picture on the photograph, and the Rosedale system, which is this area adjacent to the state line (indicating). This area in here is high bluff area. Immediately below, of course, is the wide flood plain. This meant that storm water runoff was a very critical problem in the early days, consequently it overshadowed the sanitary needs and the existing sewer system is predominantly designed for a storm water system. This tends to complicate the problem. It also means that at the time they designed the system they were interested in getting to the river as quickly as possible with no thought to treatment. Consequently, we have a number of outlets all the way around.

Q. (By Mr. Brenneisen) Will you point out to the Board the sanitary sewers, the sanitary sewer outlets to the Kansas and Missouri Rivers that are maintained and operated by Kansas City, Kansas? And can you point them out on--

MR. BRRNNEISEN: Is that Exhibit 18?

MR. STEIN: Yes.

Q. (By Mr. Brenneisen) -- Exhibit 18?

A. You want sanitary--

MR. BRENNEISEN: I wonder if he could put a red mark on that exhibit? Would there be any objection?

MR. STEIN: No objection.

Q. (By Mr. Brenneisen) For the sanitary outlets of Kansas City, Kansas.

A. They are not all on these photographs.

Q. Well, do what you can on that photograph.

A. We have a principal outlet at this point (marking).

MR. EDELMAN: Will you give the number of that point that you have marked?

A. That is Armourdale No. 28. Perhaps I should start nearer the state line. The first one is C-6 (marking), which is right adjacent to the state line and the only such sewer in this classification in the Central Industrial District.

After Armourdale No. 28, the next one around is Armourdale No. 11 (Marking) and then just out of the picture Armourdales 7 and 6.

And then we have an outlet, which is not numbered on this sheet because it is outside the drainage district, near the western city limits of Kansas City, Kansas, on the north side of the Kansas River.

Coming back to the east, on the south side of the river Argentine No. 9 is such an outlet and, of course, the contribution to the Turkey Creek Sewer from Rosedale, which is indicated here by an arrow (marking) and one additional connection to the F-7, which has been indicated as the Fairfax box.

Q. (By Mr. Brenneisen) Those are all of the sanitary outlets of the City of Kansas City, Kansas?

A. Yes, sir.

Q. Now, on behalf of the city have you carried out a sampling program of all of the outlets on the Kansas and Missouri Rivers in Kansas City, Kansas, with the exception of Turkey Creek Sewer?

A. For the past year we have been sampling these outlets, together with industrial outlets, on a 24-hour flow measuring composite sampling basis. Laboratory analyses consisted of or consist of total suspended solids, volatile suspended solids, BOD and pH, and in those cases where we thought it was indicated we also ran such tests as COD, ether extractable, oil. Let's see, one more. Well.

Q. What was the purpose of doing this sampling?

A. Primarily we were interested in determining the characteristics of a very complex sewer system to permit adequate design and determine the characteristics of the sewage.

Q. Do you feel that that sampling has been carried on to such an extent that you have the information necessary for design for sewer separation and treatment in Kansas City, Kansas?

A. We feel that we have considerably more data than is usually obtained under the same circumstances in other cities.

Q. Will you please explain to this Commission very briefly the proposed construction to obtain pollution abatement from Kansas City, Kansas, sewage? You might use the--

A. Again may I use the exhibits?

Q. --exhibits.

A. Again starting off of the picture, but I think you have the idea from the other exhibits you have, we basically have an interceptor on the south side of the Kaw beginning at the 7th Street Bridge, or this bridge in the vicinity of the outlet known as Argentine No. 21, which goes back west toward Argentine No. 9. There is also proposed a possible interceptor from the north at that point beginning at about Argentine No. 5. Somewhere near Argentine No. 9 there will be a river crossing, submarine type. There will be an interceptor on the north side of the Kaw River beginning at about the point immediately across from No. 9 east, approximately 1,000 feet north of the levee, and then generally following the river bank on around to a pumping station to be located, well, in the vicinity of, well, all of these Armourdale No. 28 notations. Actually we are just north of the Central Avenue Viaduct.

We have a lift station near to serve the Jersey Creek shed which will be away from the Missouri River and opposite F-7. Is this notation F-8 on that other exhibit? It will be in the general vicinity of this F-8 notation. This pumping station down here (indicating) and this pumping station down here (indicating) will both discharge to a junction box whereby there will be a submarine crossing across the Kaw River to the treatment plant site, which has already been given in testimony and is located right at the mouth of the Kaw River on the east side.

There is also an interceptor along the east side of the Kaw in the Central Industrial District under consideration. I might say at this time that this is the plan assuming that the industries in the general vicinity participate. If they do not, some revisions will be necessary.

Q. Mr. Hodgkinson, your consulting firm made a comprehensive rate study for sewer service charges in Kansas City, Kansas?

A. Yes, sir.

(Kansas City, Kansas, Exhibit No. 2, marked for identification.)

Q. (By Mr. Brenneisen) And I hand you here document marked Kansas City, Kansas, Exhibit No. 2, "Sewer Service Charge Rate Study, Kansas City, Kansas, June 1959". Is that the rate study you made?

A. Yes, sir.

MR. BRENNEISEN: I offer that in evidence. I think I have shown it to counsel.

CHAIRMAN WILSON: Any objection?

MR. EDELMAN: No objection.

CHAIRMAN WILSON: Received.

(Kansas City, Kansas, Exhibit No. 2 received in evidence.)

MR. BRENNEISEN: That is all.

CHAIRMAN WILSON: Were there any questions by members of the Board?

(Witness excused)

MR. BRENNEISEN: We have no further testimony.

CHAIRMAN WILSON: Both Kansas City, Kansas, and Kansas City, Missouri, have now rested. We will then take the other parties on whom notices were served as being parties considered responsible in the order in which they appear in the notice.

The Fairfax Drainage District has already appeared.

MR. SALOME: Kaw Valley has.

CHAIRMAN WILSON: The Kaw Valley Drainage District of Kansas. Anyone appearing for that agency?

MR. SALOME: They appeared day before yesterday.

MR. SAMSON: They left a statement here.

CHAIRMAN WILSON: Oh, yes, I think they left a statement here.

Kansas City Stockyards Company.

JAY B. DILLINGHAM,

called as a witness on behalf of the Kansas City Stockyards Company, being first duly sworn, testified as follows:

DIRECT TESTIMONY

THE WITNESS: My name is Jay B. Dillingham.

CHAIRMAN WILSON: Was the witness sworn?

THE WITNESS: Yes, I took it. I am appearing here today as president of the Kansas City Stockyards Company in response to notice--

CHAIRMAN WILSON: May we have your full name, please? We didn't hear it.

THE WITNESS: Jay B. Dillingham.

CHAIRMAN WILSON: Very well. Go ahead.

THE WITNESS: --in response to notice of this hearing received May 20, 1960.

We operate a public stockyards, as defined by federal statutes, for the receiving, feeding, watering, yarding, weighing, and handling of livestock offered for sale. We do not deal in livestock.

In the operation of these yards we realize that there are elements that flow through our privately-owned sewers which tend to pollute the Kansas River to some small extent. All of our private sewers discharge into the Kaw River in Kansas. Primarily our sewage is not badly polluted because it is mostly excess water from watering livestock, including some runoff from public streets in Kansas City, Missouri, as well as runoff from our own property. Generally it compares to runoff from agricultural land. We are confronted with pollution abatement in the entire Missouri Basin and are going to learn to live with it and help pay for it.

We were undoubtedly notified to appear here today because of our outlets into the Kansas River. Several years ago we were approached by the City of Kansas City, Kansas, inquiring if we planned to treat our sewage or if we would look to the City of Kansas City, Kansas, for that service. We told them at that time we planned to use city facilities.

We are still of the same mind and have for several months been negotiating with the city toward that end. Being in the stockyards business, we have no desire to operate a sewer treating plant and hope to leave that kind of operation to the experts in the field. Rates proposed in the ordinance now under study are out of line with charges in other areas for treating our type of waste. We, along with packing houses near the stockyards, have submitted a plan proposing treatment of this sewage by other than public bodies. It is under study by appropriate officials and has not been accepted or rejected as of this date. We believe the city can treat our sewage as cheaply as we could treat it in a separate plant, and have no doubt that these negotiations will soon be brought to a conclusion satisfactory to everyone.

One further remark. We have not opposed pollution abatement and do not oppose it. We will use our efforts to be in step with the program of the governing bodies in this metropolitan area.

CHAIRMAN WILSON: Any questions?

Members of the Board?

THE WITNESS: Thank you very much.

(Witness excused)

MR. BRENNEISEN: Mr. Chairman, our Chamber of Commerce of Kansas City, Kansas, would like to make a statement, with your permission.

CHAIRMAN WILSON: Very well.

RALPH BATES,

called as a witness on behalf of the Kansas City, Kansas, Chamber of Commerce, and being first duly sworn, testified as follows:

DIRECT TESTIMONY

CHAIRMAN WILSON: Give us your full name, please, and position, representation.

THE WITNESS: My name is Ralph Bates. I am chairman of the water committee of the Chamber of Commerce of Kansas City, Kansas, and I have been asked to read this statement on behalf of the president of the Chamber, Mr. Leonard Childers, who was called away just a few minutes ago. The program lasted just a little too long for him to stay and make the statement himself.

CHAIRMAN WILSON: You may proceed.

THE WITNESS: I have a copy here if the recorder would care for it.

The Chamber of Commerce in Kansas City, Kansas, acts in the interest of the industrial, commercial and civic activity in the community. This includes the Kansas Companies listed in the notice of hearing published by the Department of Health, Education and Welfare on March 17, 1960. The Chamber of Commerce has frequently voiced itself in favor of a pollution abatement program for the community and recommends that industry and the city work together on a system which will satisfy all health requirements. The policy of the Chamber was officially stated in November of 1957 as follows:

"The Chamber of Commerce of Kansas City, Kansas, recognizes that pollution abatement is necessary and inevitable for the country as a whole and for this community in particular. It, therefore, has taken steps to keep industry advised of the status of activity in this direction and recommended that each industry review its own situation in this respect. Inasmuch as the industries of Wyandotte County have been cooperating with the City of Kansas City, Kansas, in developing a sewage treatment plan and since the City of Kansas City, Kansas, has voted 3.7 millions of dollars in bonds in an electrion in November 1954 for the purpose of constructing sewers and purchasing treatment plant sites, it has been recommended that the program be continued and that every effort be made to complete planning.

"The Chamber of Commerce, based on the recommendations of the Pollution Subcommittee, Water Committee, believes the city should take continued steps toward meeting such deadlines as may be established on contracting for sewage treatment facilities. They recommend the city treat sanitary and industrial wastes that can practically be collected by the city sewer system with industry removing their own peculiar wastes not reasonably compatible with city treatment. Industries desiring to use their own treatment processes should be permitted to completely process all or part of their effluents so that they can be dumped directly into the rivers or the storm water system. The Chamber of Commerce of Kansas City, Kansas, recommends that municipal sewage handling facilities be financed by revenue bonds based on service charges. The Chamber also recommends study toward the development of a metropolitan sewer district."

And I interject here, it is not in the statement, but this was in 1957 and at that time we were in the middle of these studies that you were talking about trying to get together on a metropolitan district and since they didn't materialize this has since been abandoned. Back to the statement.

"The Kansas City, Kansas, Chamber of Commerce will continue an active role in completing plans for simultaneous construction of sewage treatment for the entire metropolitan area.

"Approved by the Board of Directors, Kansas City, Kansas, Chamber of Commerce November 21, 1957."

In keeping with this policy, the Chamber recommended to the city some time ago that a sewer service charge be placed into effect to provide funds for engineering a satisfactory pollution abatement system. The Chamber was also active in bringing about a bill in the state legislature that would permit these service charges, and is currently working with the city to develop a practical ordinance for collecting the charges. It is imperative that these charges be timed and sized properly with respect to other communities in the metropolitan area so that the businesses in Kansas City, Kansas, will not be at a competitive disadvantage.

At this time, the Chamber of Commerce of Kansas City, Kansas, wishes to reaffirm that it is 100 percent in favor of a pollution abatement program for this community, and to state that it will continue to work toward a practical solution of the problem.

The Water Committee of this Chamber has held numerous meetings on this subject in the last four years, and the attached list of significant progressive actions taken by the Chamber is submitted as evidence of the efforts being applied, and the results obtained.

I don't think there is any necessity to read this list. It is there for review. I will read it if you care to into the record, but it will be available for the Board if they wish to study it.

CHAIRMAN WILSON: You may, if you wish, have it marked as an exhibit and leave it as a schedule of the events that are shown on it.

THE WITNESS: It is a part of the written statement.

CHAIRMAN WILSON: All right.

CHAIRMAN WILSON: Kansas City, Kansas, Chamber of Commerce Exhibit 1, and file it.

(Kansas City, Kansas, Chamber of Commerce Exhibit No. 1 marked for identification.)

THE WITNESS: I am not a lawyer, so I don't know the legal requirements.

Most of this action was referred to by the counsel for the City of Kansas City, Kansas, and we have worked very closely with them on all of this activity.

MR. BRENNEISEN: Mr. Bates offers in evidence Chamber of Commerce Exhibit No. 1.

CHAIRMAN WILSON: Any objection?

MR. STEIN: No objection.

CHAIRMAN WILSON: Received.

(Kansas City, Kansas, Chamber of Commerce Exhibit No. 1 received in evidence.)

CHAIRMAN WILSON: You offer that exhibit in connection with your statement?

THE WITNESS: Yes, sir.

CHAIRMAN WILSON: It is received for that purpose.

Any questions?

That is all.

(Witness excused)

CHAIRMAN WILSON: The next party in order is the Missouri Valley Serum Company. Did they appear before?

SECRETARY AYERS: They made a statement.

MR. EDELMAN: Bio-Lab, Mr. Chairman, I think Bio-Lab appeared for that, didn't they?

MR. SAMSON: Bio-Lab appeared.

CHAIRMAN WILSON: Oh, yes.

The National Cylinder Gas Company has also appeared.

The National Laboratories Corporation. Anyone for that concern?

Phillips Petroleum Company.

MARTIN E. MC MAHON,

called as a witness on behalf of the Phillips Petroleum Company, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY CHAIRMAN WILSON:

Q. Give us your full name and position, please.

A. My name is Martin E. McMahon. I am supervisor in the chemical and waste treatment section of the engineering division of the refining department, Phillips Petroleum Company.

Q. Where is your residence?

A. I live at 1417 South Oak, Bartlesville, Oklahoma.

Q. Do you have a statement you wish to make in behalf of the Phillips Petroleum Company?

A. Yes, please. I will read it.

Q. You have it typed there, have you?

A. I have given a copy to the Secretary.

Q. You have given a copy to the reporter?

A. Yes.

Q. Proceed.

A. During the past four years, following notification by the Kansas State Board of Health of the need to minimize taste and odor bearing material being discharged to the Missouri River, the Phillips Petroleum Company's Kansas City refinery has been actively engaged in an extensive program to improve the quality of the refinery effluent. Our purpose has been complete cooperation with the Kansas Board of Health and continuing good realtions with all of our downstream neighbors.

At the first review of the in-plant situation, we found a great need for information regarding the volume and characteristics of the process wastes being discharged both continuously and batch-wise to the refinery drainage sewers. A fact-finding board composed of refinery personnel appeared to be an immediate necessity, and one was appointed to develop the appropriate information. It consisted of the Refinery Superintendent, the Assistant Chief Chemist, the General Stock Division Superintendent, and an assigned process engineer.

The committee promptly initiated a program to develop information about the refinery's process wastes--sewers were inspected daily, samples of process wastes were taken from the outfalls and from inplant locations, and an extensive effort was made to find and test the batch dumps of material that possibly could have reached troublesome proportions. This program, which at its peak required the major efforts of two men in chemical testing, is still being continued to detect any changes in the process effluents.

In the second phase of our program, items detected by the fact-finding program and which could be easily and simply changed with resultant improvement in the refinery effluents, were quickly revised. Some examples of these items may be of interest.

We found sizable amounts of troublesome oil emulsions in one of our oil separators which were caused by trace amounts of an emulsifying chemical being discharged into the oil-water sewers. The volume of these emulsions overloaded the emulsion treatment facilities but was reduced to easily handled proportions when the emulsifying chemical was discharged into an oil-free sewer.

Excellent results were obtained by further attention toward segregation of wastes in various sewer systems. Water treater sludges and boiler blow-down were piped to the solids sewers and cooling tower blowdown from the light hydrocarbon units was drained into the oil-free water system along with storm water from areas free of chance oil spills. Each stream is handled as a separate item and careful consideration is given to selection of its disposal point.

The refinery also had a periodic build-up of emulsion in another oil separator due to operation of a chemical treater. Some of this emulsion passed through the separator. To correct this, the effluent from the separator was pumped to a 50,000-barrel tank for further settling; which resulted in a sizable improvement in oil reduction. Since that time, one of the chemical treaters has been replaced with an electrical unit, thus reducing the problem to some extent and plans will be described later for further oil reduction.

One of the most obnoxious wastes in a refinery is the spent caustic derived from scrubbing acid oil or phenolic and cresylic material from the catalytically cracked gasoline. The refinery has installed loading equipment to segregate, store, and ship this material to a company that furthur processes it in recovering usable components. This material has a value only a little higher than its transportation cost, but 211,594 gallons were shipped from the refinery in 1959.

About two years ago, after reaching a point of diminishing returns in outfall improvement with sewer segregation and the obvious revisions, consideration was given to further reduction of phenolic material and sulfides, since they are often considered distasteful at low concentrations. After much testing and study, the installation of equipment for further processing of these wastes was designed and constructed at considerable cost to the company. The installed process consisted of steam stripping sour condensate water until practically all the sulfides and lesser amounts of ammonia and phenolic material were removed and burned in a furnace firebox.

As a result of this installation and other revisions, the refinery has greatly increased the quality of its two outfall streams over the past four years. Reductions calculated for the combined effluents are about 95 percent for phenolic material, 12 percent for sulfides, and 84 percent in Phenolphthalein aklylinity. However, the normal oil concentrations in the refinery outfalls have not yet been reduced to a satisfactory level.

Solution of this oil problem has been given a great deal of additional consideration during the past six months and after much further testing and consultation with representatives of the Kansas State Board of Health, the design of an installation to remove practically all the oil from the refinery effluent has been selected, and detailed engineering is in progress.

The Kansas Health Service has recently indicated tentative approval of our plans and, consequently, the estimate and design will be forwarded through company channels for early approval and installation.

I might clarify this a little bit in that we are required to get a permit from the Kansas Board of Health, as you all know, and this tentative approval for the equipment was primarily their feeling that this equipment would suffice and that--but it was not a permit, if you understand.

Again we would like to express the Phillips management's desire to do its part in solving the problems being encountered in the Missouri River, and you can be assured of our continuing efforts toward effluent improvement.

This completes the statement.

CHAIRMAN WILSON: Any questions?

That is all.

(Witness excused)

CHAIRMAN WILSON: Atchison, Topeka and Santa Fe Railway Company.

SECRETARY AYERS: No, they made an appearance.

CHAIRMAN WILSON: Oh, yes, they have already made their appearance.

Sinclair Refining Company?

MR. FUHRI: Mr. Chairman, Mr. W. N. Smith will make the statement.

WILLIAM N. SMITH,

called as a witness on behalf of the Sinclair Refining Company, being first duly sworn, testified as follows:

DIRECT TESTIMONY

THE WITNESS: My name is William N. Smith. I am terminal manager for the western division of the Sinclair Refining Company. I have a very brief-- Beg your pardon?

CHAIRMAN WILSON: Your residence?

THE WITNESS: 1309 West 72nd Street, Prairie Village, Kansas.

I have a short statement I would like to read.

Sinclair Refining Company plans to examine its existing waste treatment system at its pipeline terminal property in the Argentine District and if found to be improper or inadequate Sinclair plans to complete and place in operation an adequate and proper waste treatment system for disposal of wastes before June 1, 1961.

That completes my statement.

CHAIRMAN WILSON: Any questions?

That is all.

(Witness excused)

CHAIRMAN WILSON: I skipped Procter and Gamble Manufacturing Company. Is someone here for them?

RALPH PETERSON,

called as a witness on behalf of the Procter and Gamble Manufacturing Company, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY CHAIRMAN WILSON:

Q. Will you give your name, position and address, please?

A. Ralph Peterson. I am a chemical engineer in the engineering division of Procter and Gamble in Cincinnati. I am responsible for pollution control measures. My address is 7917 Burgundy Lane, Cincinnati, Ohio.

Q. You have a statement to make on behalf of the company?

A. Yes, sir.

Q. Proceed.

A. In Procter and Gamble's Kansas City, Kansas, plant a full range of soaps and detergents for personal and household care are manufactured. The raw materials for the products are vegetable oils, animal oils, and relatively small quantities of common mineral acids, phosphates, and miscellaneous organic chemicals.

The industrial wastes from these operations, which are non-toxic and non-hazardous, are presently discharged in part to the Kansas River, and in part to municipal sewers which ultimately reach the river. Present waste treatment consists of grease interceptors which remove floating material and immediately settleable solids. Acid wastes are neutralized before leaving the plant.

When the need was established for additional waste treatment in the Kansas City area, Procter and Gamble began studies of the best way to meet this need. Because Procter and Gamble plant wastes were being treated successfully in municipal sewage plants in other communities, combined treatment with domestic wastes in a new Kansas City, Kansas, plant was the logical treatment method indicated for the Kansas City plant. Subsequent investigations were made by Dr. G. A. Rohlich at the University of Wisconsin on plant wastes whose composition was similar to those of our Kansas City factory. From these studies, we learned that Procter and Gamble wastes are entirely amenable to treatment in a municipal plant in combination with domestic sewage. In summary:

1. Primary treatment such as planned for Kansas City will remove 40 percent of the BOD and 67 percent of the suspended solids from our wastes. This performance compares favorably with that achieved by primary plants handling domestic sewage alone.

2. The raw sludge from this settling operation is entirely amenable to reduction in digesters in mixtures as high as one to one with raw domestic sludge. Even at the one to one ratio, the reduction in volatiles is the same as pilot digesters handling domestic sewage.

3. The effluent from the primary settling underwent a 95 percent BOD reduction when fed to an activated sludge system in ratios as high as three parts Procter and Gamble waste to one part domestic waste.

These studies reinforce the original decision to discharge our wastes to the city treatment plant. The company has notified the City of Kansas City, Kansas, of its desire to use the municipal treatment system and of its willingness to pay a fair sewer charge for this privilege. Connection to the city sewers will be made as soon as sewers are available.

In addition, Procter and Gamble has supported the Kansas City, Kansas, Chamber of Commerce in its pollution abatement efforts, including the successful campaign to secure enabling legislation by the State of Kansas that would permit Kansas City, Kansas, to apply a sewer service charge to finance engineering and construction of a treatment system.

Currently, we are conducting a plant-wide survey of waste sources. This survey will serve as the design basis for our program to divert waste streams from the river to the municipal sewers. The changes and additional construction indicated by this survey will be completed so that a tie-in to the city sewer can be made as soon as the sewers become available.

In summary, Procter and Gamble has studied its industrial waste problem and is working jointly with the City of Kansas City, Kansas. We are now taking the necessary steps to use the municipal treatment system, and are going to pay a fair price for this service. This, we believe, represents effective progress towards pollution abatement.

End statement.

CHAIRMAN WILSON: Any questions?

That is all.

(Witness excused)

CHAIRMAN WILSON: Swift and Company.

MR. ELSON: I have a medium-sized statement on behalf or Swift.

WILLIAM B. ELSON, JR.,

called as a witness on behalf of Swift and Company, being first duly sworn, testified as follows:

DIRECT EXAMINATION

BY CHAIRMAN WILSON:

Q. You have already entered your appearance?

A. Yes, sir.

Q. But for the purpose of the record just state your name, address and position here.

A. Yes. My name is William B. Elson, Jr., 7740 South Euclid, Chicago, Illinois. I am an attorney in the law department of Swift and Company, which is the operator of a meat packing plant in Kansas City, Kansas.

Swift and Company appears in response to notice on May 17, 1960, from Arthur S. Flemming, Secretary of Health, Education, and Welfare. We wish to state for the record that while we accept the conclusion of the conference held on December 3, 1957, by officials of the States of

Missouri, Kansas, and the office of the Surgeon General of the Public Health Service of the United States, that untreated sewage and industrial wastes are finding their way into the waters of the Missouri River and tributaries and streams of the Kansas City Metropolitan Area, Swift and Company, not having been present at said conference, and not having available to it any of the evidence that was discussed therein, does not admit the effects outlined in paragraph 2 of the agreements reached at the conference. Swift and Company agrees that if there is pollution with the stated effects, appropriate treatment prior to discharge into the streams should be provided and that unless industries discharge into a municipal waste collection and treatment system, the industry should provide such treatment.

We are pleased to note that in said notice cognizance is taken of compliance with schedules for corrective action for Kansas City, Kansas, as approved by the Kansas State Board of Health.

Swift and Company has actively been considering the problem at Kansas City, Kansas, over an extended period of time. Without burdening the record with details, we might merely state that pursuant to meeting of December 4, 1959--and I believe that is the meeting that City Attorney Brenneisen referred to just a little bit ago--with officials of Kansas City, Kansas, and Mr. Dwight Metzler of the Kansas State Board of Health, Swift and others interested were granted approximately 60 days to obtain an engineering report from outside consulting engineers with respect to a possible treatment plant separate from the city plant. Pursuant to the time granted by the State Board of Health, on February 15, 1960, J. B. Dillingham, Chairman of the Stockyards and Packing Industry Group, delivered to the Board of City Commissioners at Kansas City a report prepared by Alvord, Burdick and Howson, consulting engineers, Chicago, a firm that is outstanding in its experience in dealing with packing house and related wastes, this report on waste disposal of the stockyards and packing house industries and on a treatment plant discharging effluent to satisfy the requirements of U. S. Public Health Service. In transmitting the report, Mr. Dillingham stated that he believed the city could perform the service by including the disposal of the waste from indicated annual amortization, operating and maintenance cost of $121,000 a year for the first 30 years and $47,500 annually thereafter that Mr. Howson found. He, therefore, indicated that he, on behalf of these industries would welcome meeting with the city commissioners. Subsequently, with the approval of the industries, a copy of the report entitled "Report on Waste Disposal, Stockyards and Packing Industries, Kansas City, Kansas" was made available by the city to the Kansas State Board of Health, and Acting Director of Health Russell L. Culp and Mr. L. R. Howson of said firm have engaged in correspondence. It is my further understanding that Mr. Dwight Metzler, Chief Engineer of the Kansas State Board, has requested a meeting early in July of Mr. Howson and Mr. Truman Schlup, consulting engineer to the City of Kansas City, Kansas, to further discuss this report.

Subsequently, as City Attorney Brenneisen has indicated, a proposed waste disposal ordinance was introduced before the Kansas City Commission for first reading on April 5, 1960, in compliance with the time schedule that had been agreed upon by the State Board of Health, contemplating adoption by the city of rate schedule by April 1st.

Several meetings have been held, as indicated by Mr. Brenneisen and Mr. Dillingham, within the industry group, with other industries, with the Chamber of Commerce committee and city officials regarding said ordinance. The latest revision of the ordinance designed to meet certain of the suggestions of Swift and others similarly situated was made available to our Kansas City organization on June 2nd. This is the ordinance that has been introduced in this proceeding by the City of Kansas City, Kansas, I believe as its Exhibit 1. There are still some provisions that do not meet the needs of all interested parties, but we do not know of any reason why this matter cannot be worked out to the mutual satisfaction of all concerned.

Assuming that the stockyards and the packing industry group can make arrangements for the handling of their wastes through the city plant at no greater cost to the industries than would be required for their own installation, it seems clear that the mutual interest of the municipality and the industries would be best served by following that course of action. We accept the soundness of revenue bond financing, and equitable sewer service charges to users of the system for their contribution as the basis of funding the cost of that part of the sewage treatment plant and appurtenances necessary to handle the effluent of present users. Swift has devoted considerable time, effort and expense to the problem and is trying, in cooperation with our neighbors in the stockyards and packing group, to reach a solution which will be the most economical and logical one in solving the common problem. Industry stands ready to pay its proper share to the best of its ability when and if it is determined what pollution is occurring in the area and the solution of the problem is mutually agreed upon by the city and the members of the industrial group.

Swift and the other members of the group have been and are aware of the problem and its magnitude. As above indicated, considerable time and expense have been devoted to studying corrective measures and even larger expenses are ahead. We have been and are willing to cooperate, both with the city government, state government and the federal authorities.

We share the optimism of Mr. Dillingham that the city officials will continue negotiations and that ultimately an ordinance will be adopted with charges that are in line with charges in other areas for treating our type of waste and not inconsistent with what our cost would be in a separate plant. Following adoption of such an ordinance, Swift is prepared to take such action in its plant property as is necessary to comply with the reasonable requirements of such ordinance within the time limits that may be agreed upon between the city, state and federal authorities. We respectfully submit that in the event a satisfactory ordinance is not adopted, and the Secretary of Health, Education and Welfare, based upon the findings and recommendations of this Board, issues an order embodying a time schedule, said order should not require Swift to take action any more quickly than the two Kansas Cities, Fairfax, North Kansas City, and other industries. In any event, there would appear to be no sound basis for any faster time schedule for the cities and industries in Kansas than across the river in Missouri.

I would like to make just two additional brief comments. Mr. Brenneisen raised the question in his examination of Mr. Hopkins as to how realistic the September 1, 1960, date was for industry in effect reaching the final decision that it was going to come into the city treatment plant. I am no engineer and Mr. Hopkins is and I have the greatest respect for his judgment, but in the brief time that has been available to us, consultation with Dr. Sollo, our chemical engineer, who is here, and discussion with others that was permitted within the time available, and considering that the meeting between the two engineering groups and the state won't be occurring until some date in July, we think a September 1 date is unrealistic. Assuming that the Board concurs in that feeling, we respectfully submit that any time schedule should take into account a modest delay to accord to whatever departure there is from the government's recommendation.

Q. (By Mr. Samson) Mr. Elson, before you leave that point, what is your suggestion?

A. We think that September 1 date is probably premature by at least 60 days.

MR. SAMSON: I see. Thank you very much.

THE WITNESS: One other item I would like to mention, and I guess maybe it is just my legalistic mind at work, but I would sure welcome a specific finding by this Board as to whether Turkey Creek Sewer is an inter-state water.

CHAIRMAN WILSON: That concludes your statement?

THE WITNESS: Yes, sir.

CHAIRMAN WILSON: Any other questions?

That is all. Thank you.

(Witness excused)

MR. KOENIGSDORF: May I join with counsel in that request he just made for a determination?

CHAIRMAN WILSON: You may.

MR. KOENIGSDORF: Thank you.

CHAIRMAN WILSON: It will be so noted.

Midwest Cold Storage and Ice Corporation.

MR. MURPHY: We have no statement to make.

CHAIRMAN WILSON: The last one on the list, Buick-Oldsmobile-Pontiac Assembly Plant.

JOHN MURPHY,

called as a witness on behalf of Buick-Oldsmobile-Pontiac Assembly Plant, being first duly sworn, testified as follows:

DIRECT TESTIMONY

THE WITNESS: My name is John Murphy. I am a member of the law firm of Tucker, Murphy, Wilson and Siddens, 831 Scarritt Building, Kansas City, Missouri. I am an attorney for General Motors Corporation and at this time desire to make a statement on behalf of the Buick-Oldsmobile-Pontiac Assembly Division of the corporation, which has been cited in the notice of this public hearing in relation to the assembly plant in the Fairfax Industrial District.

The Kansas City Assembly plant operated by the Buick-Oldsmobile-Pontiac Assembly Division, General Motors Corporation, is a leased facility situated at Fairfax and Kindelberger Roads in Wyandotte County, Kansas, and is located within the Fairfax Drainage District. This assembly plant has three outlets for disposing of water wastes from the plant.

The vast majority of this water goes into the sewer system of the Fairfax Drainage District. This includes all the sanitary sewage and all other contaminated water, approximately 80 percent of the cooling water from the air conditioning system and approximately 80 percent of the storm water.

In addition to the above, approximately 20 percent of the cooling water from the air conditioning system and 20 percent of the storm water as collected along the east side of the plant is discharged to a sewer that is part of the drainage system of the Fairfax Airport. There is no contaminated water that enters this sewer from this plant. We understand that the outfall from this airport sewer system is also a responsibility of the Fairfax Drainage District.

The third outlet from this plant is an acetylene sludge outlet from a two and one-half inch pipe which discharges lime slurry into a lagoon on a flow way or back of the Missouri River. This discharge had the written approval of the Kansas State Board of Health, Division of Sanitation, Water Pollution Control Section, The Fairfax Drainage District of Wyandotte County, Kansas, The Department of the Army, Corps of Engineers for the Kansas City District, the Division of Health of the State of Missouri, Bureau of Public Health Engineering, the Missouri Conservation Commission, and the Forestry, Fish and Game Commission of Kansas at the time it was installed in May 1950. It was considered at that time to be a desirable discharge since the sludge is a slaked lime. In the event it should now be determined that this outfall is undesirable, it can be eliminated.

I might interpolate here that it is my information that this would certainly fall within any de Minimis rule. There is approximately 6,000 gallons of this going over the dike into the lagoon currently.

This plant has provided the Fairfax Drainage District with the necessary engineering data concerning the volumes and analysis of the sanitary sewage and other contaminated water discharged from the plant into the sewer system of the Fairfax Drainage District. It is assumed that any feasible plan developed by the Fairfax Drainage District, and acceptable to the Kansas State Board of Health, would be acceptable to this Hearing Board. It is our understanding that the Fairfax Drainage District contemplates start of construction of planned interceptor sewers on or before March 1, 1961, and completion of construction of these sewers and a sewage treatment plant by July 1, 1962, in accordance with the requirements of the Kansas State Board of Health.

Respectfully submitted.

CHAIRMAN WILSON: Any questions?

That is all.

THE WITNESS: Thank you.

(Witness excused)

CHAIRMAN WILSON: Are there any other parties represented desiring to be heard?

If not, the taking of evidence at this hearing will be concluded, unless there are some parties having rebuttal to the evidence already submitted. Does the government have any rebuttal?

MR. STEIN: No, sir.

CHAIRMAN WILSON: Do any other parties desire to submit any rebuttal to any of the evidence already received?

Then the taking of evidence is concluded. It is understood that all parties rest so far as the submission of evidence is concerned.

Considering the previous discussion after the recess--

MR. MURPHY: Mr. Chairman, may I ask a question? There are two lists included in this notice. Am I correct in the understanding that those that are listed in the second list are not considered as true parties to this proceeding? There has been no testimony concerning it.

CHAIRMAN WILSON: The Surgeon General has stated in this notice that he does not have reason to believe that the following persons are discharging anything that endangers the health or welfare of persons in another state.

MR. SALOME: They are not in the notice.

MR. MURPHY: They are in my notice.

CHAIRMAN WILSON: They are listed here and notified that the Board may consider and evaluate such discharges in connection with its finding, whether discharges from the persons above named constitute pollution subject to abatement under the federal act.

At any rate, such parties would have an opportunity to appear if they desire.

MR. MURPHY: My point is that I have heard no testimony concerning any of them and are we to understand that they are not in fact parties?

CHAIRMAN WILSON: In the absence of any evidence of their responsibility, they could not very well be held responsible as parties by the Board.

MR. MURPHY: Thank you.

CHAIRMAN WILSON: Then will it be satisfactory to counsel if we recess until 9 o'clock tomorrow morning and then proceed to close with arguments?

MR. SALOME: Mr. Chairman--

MR. SAMSON: Let's go into executive session.

CHAIRMAN WILSON: I am just making an inquiry.

MR. SALOME: From whom? You are getting an answer right quick from me here.

CHAIRMAN WILSON: Just a minute.

I would like to ask this question of counsel. Now, what I propose to do before we adjourn here this evening, I want to take a brief five-minute recess and retire to the retiring room with the Board and get the advice of the Board as to what they desire to do about the matter. I first want to find out what the desires of counsel are as to closing arguments. You have already indicated in a general way as to how much time you will take.

MR. STEIN: Yes. We are entirely agreeable to the wishes of the Board. We will either stay tonight or wait until tomorrow. We are entirely at your disposal.

CHAIRMAN WILSON: If the Board wishes to hear closing arguments tonight--

MR. JOHNSON: Right now.

CHAIRMAN WILSON: --would counsel be willing to submit them tonight?

MR. STEIN: Yes, we would.

MR. JOHNSON: Right now.

MR. SALOME: How about now?

CHAIRMAN WILSON: Just a minute. Let's hear from all counsel. It is now 5:30. Would counsel have time to conclude their arguments right away if we want to go ahead with them?

MR. STEIN: We would.

CHAIRMAN WILSON: How about counsel for the city?

MR. KOENIGSDORF: I don't know if closing argument is going to sway this Commission or not.

CHAIRMAN WILSON: I didn't hear you?

MR. KOENIGSDORF: I just said I don't know whether closing argument is going to sway this Commission or not, Mr. Chairman.

CHAIRMAN WILSON: That might be called an overt remark.

MR. KOENIGSDORF: I would like at least a little period in order to gather thoughts. I don't suppose the argument will be too complete anyway.

CHAIRMAN WILSON: That is the reason I am asking for wishes of counsel, because certainly I am sure the Board will feel that if counsel for any responsible party, especially the cities, wants a little time to consider the evidence, it should be allowed.

Now, then, if you wouldn't be prepared to go on immediately, would you be prepared to go on this evening?

MR. KOENIGSDORF: I can. I am against night sessions, but I can do it if I have to.

CHAIRMAN WILSON: If that is the desire of the Board, then, and I say I want to retire and discuss this with the Board because there are some other angles of this case that we have to consider--

MR. BRENNEISEN: Of course, your Honor, as far as I am concerned, it is going to take me, I expect, five or ten minutes and any time after ten or fifteen minutes I would like to have at least a fifteen-minute recess before we start.

CHAIRMAN WILSON: Well, suppose we should decide that we want to conclude or to take the arguments this evening. If we should now adjourn until 7 o'clock would that be satisfactory? I am asking counsel if that would be satisfactory with them?

MR. BRENNEISEN: I am not going to enjoy a dinner between now and when this thing is over anyway. The shorter the better as far as I am concerned.

CHAIRMAN WILSON: I think we have sounded out the sentiments of counsel and we will now take a five-minute recess and the Board will retire and return at the end of that time.

(RECESS)

CHAIRMAN WILSON: The session will come to order.

The Board has decided not to hold a session this evening and to leave it to counsel whether we reconvene at 8:30 or 9 o'clock in the morning for closing arguments.

MR. STEIN: I think the consensus of counsel is 9 o'clock.

CHAIRMAN WILSON: Very well, we will recess now until--

MR. KOENIGSDORF: Just one moment, please. Before you recess I would like on behalf of Kansas City, Missouri, at the close of all the evidence to renew my motion as to dismissing Kansas City as a party to this action.

CHAIRMAN WILSON: Motion denied.

Recessed until 9 o'clock tomorrow morning.

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WHEREUPON, the hearing was adjourned until 9 o'clock a.m. of the following day, at which time the following further proceedings were had and entered of record, to-wit:

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MORNING SESSION, FRIDAY, JUNE 17, 1960

CHAIRMAN WILSON: The hearing will come to order.

The government may proceed with its argument.

MR. STEIN: Mr. Chairman, we are proceeding under Section 8 of the Federal Water Pollution Control Act. This act states, "The pollution of interstate waters in or adjacent to any State or States (whether the matter causing or contributing to such pollution is discharged directly into such waters or reaches such waters after discharge into a tributary of such waters), which endangers the health or welfare of persons in a State other than that in which the discharge originates, shall be subject to abatement as herein provided."

I think the first question we would want to take up very briefly is the definition of interstate waters. The act provides that interstate waters are those waters which form a part of or flow across the boundaries of two or more states, and I think it is very clear from looking at the exhibits, first, that the Kansas River is a tributary of the interstate waters of the Missouri River which form a part or flow across the boundaries of two or more states.

I direct your attention to Turkey Creek, which goes from Kansas to Missouri and back to Kansas and generally follows the old Turkey Creek bed. The natural flow from this area and the storm water flow into Turkey Creek. But for that sewer they would flow into Turkey Creek and go out. This, we believe, constitutes interstate waters within the meaning of the federal act. But for the construction of that covering, the waters would flow into Turkey Creek. To hold otherwise would mean that just by the covering of a water the jurisdiction of a federal act could be avoided, and we don't think this was the case.

Again I think in this type of case we have to look at the purpose of the statute. The purpose of the statute was to avoid the kind of controversy states would get into in water cases. The Congress had in mind, and I think the legislative history is clear, the controversies between New York and New Jersey in the water case and between Illinois and the other lake states where the cases dragged on in the Supreme Court in the original jurisdiction for years. This is precisely the kind of situation that the federal act was directed toward, to establish a procedure for getting at complex municipal situations of this kind.

I think the evidence in this case was prepared painstakingly. We showed in detail where the pollution originates, what happens in the stream, and a considerable interference with a variety of legitimate uses all the way down the Missouri River through its confluence with the Mississippi and into the Mississippi River.

There is one more point I would like to comment on very, very briefly. While there may be two or more views on many points of law, I think it is well settled by all authorities that where the combined discharges from several sources result in the pollution of a stream, each polluter is individually liable as contributing to the total harm, although injury from his action considered alone would be nominal.

I would like to hit just one last point and that is to call attention to the term "endanger" in the statute. The statute says "which endangers health or welfare of persons in a state other than that in which the discharge originates." Where the term "endanger" is used in the statute the courts generally held it to imply merely the possibility of harm and do not restrict its meaning to any act or situation wherein actual harm or injury must ultimately be inflicted. This definition of "endanger" as used by the courts is the same definition we find in Webster's International Dictionary, for example in the Second Edition Unabridged 1951 and in other editions of that dictionary, where endanger is defined as "to put in peril or bring about the danger of, to put in jeopardy."

That concludes our statement. Thank you. I want to thank the Board and counsel for the other parties for their indulgence and forbearance in sitting with us through a long and oftentimes hard and boring case.

Thank you.

MR. SAMSON: Mr. Stein, before you sit down I would like to ask a question. Is it the position of the government that without question Turkey Creek is interstate waters?

MR. STEIN: Yes, sir.

MR. SAMSON: And it is the government's position that the mere covering of the waterway artificially with a cover doesn't change that aspect of the stream?

MR. STEIN: That is correct, sir. I might call the Board's attention to places like New Orleans, where many of the bayous and streets are covered. That doesn't change that at all. And I think if you wish to, we have cases which bear that out; and I don't know that we would want to cite these cases at this time unless the Board felt it were necessary.

MR. SAMSON: You take that position in view of the fact that the head of that sewer originates in Kansas, goes over into Missouri and then crosses the boundary again and goes into Kansas?

MR. STEIN: That is right. And we also take that position because this sewer is laid in what is substantially the old Turkey Creek bed with divergence up there, (indicating Exhibit 18) but substantially that is in the old bed. All the waters which would have naturally drained into Turkey Creek but for that cover still go into this sewer, Turkey Creek Sewer.

Now, I would refer the Board, if they wish, to the case of State Board of Health against the mayor of Jersey City in 35 Atlantic 835, and there are several other cases.

CHAIRMAN WILSON: Any other questions, gentlemen?

MR. SAMSON: I have just one more question. That is in connection with Mr. Brenneisen's request. On an extension of 60 days on point 5, was it, of the schedule, Mr. Brenneisen?

MR. BRENNEISEN: Yes, sir.

MR. SAMSON: Does counsel have any comment to make in connection with that matter?

MR. STEIN: We would have made our best judgment as to an equitable schedule. I think all the plans such as requested made by industries and the others for modification of those should be left to the discretion of the Board.

I would like to indicate that this is not a new case. We have been here; we have had a conference in 1957. There is a long record of state action and this question of asking for delays every time we come in is something that no doubt needs consideration, but I wonder if the time will ever come or we can ever wait long enough where we would come in and ask for a little cleanup when another delay wouldn't be requested.

MR. SAMSON: Well, of course, this involves Kansas City, Kansas. I mean you knew that is where my inquiry went to?

MR. STEIN: That is correct. And I think Kansas City, Kansas, was included in 1957 too.

MR. SAMSON: Very well. Thank you.

CHAIRMAN WILSON: Kansas City, Kansas?

MR. BRENNEISEN: Kansas City, Missouri, or Kansas City, Kansas?

CHAIRMAN WILSON: Kansas City, Kansas, is named first in the notice, that is why. You gentlemen may suit yourselves about which one wants to go first.

MR. BRENNEISEN: Members of the Commission, I want to thank you for your courtesy and your indulgence with us in this hearing and also say that we appreciate the fact that you are performing a public service here, probably at not little personal inconvenience.

Kansas City, Kansas, on paper can comply with this schedule. We don't think it is practical. There are too many contingencies that can come up, too many things that can happen, and we don't think it is a realistic schedule. Of course, on paper we can do it.

The first date here is September 1, 1960, in which you are directing our industries to advise us of the volume and character of sewage that they are going to discharge through our sewers. From the city's standpoint we think that this should also include an order for the industries that are not going to discharge wastes through our sewers to tell us so. We would be in a much stronger position to definitely have a commitment from them that they are not going to discharge the wastes through our sewers.

Now, our situation in Kansas is this. We have had the advantage of a year of sampling. The industries have had this advantage. We have meetings set up the first two weeks in July between the industries and the State Board of Health and also with the city to discuss our rate problem. We also have a public meeting set up for the first two weeks in July to discuss our rate schedule.

After this schedule is definitely fixed, and industry is going to have to work pretty fast with their engineers to be able to know whether it is financially feasible for them to discharge their wastes through our sewers or take care of it themselves to be able to come up with an answer by September 1, 1960, I just doubt whether it is practical for the industries in our area to do that. And as far as an industry in an area where they haven't had the advantage of sampling, where they haven't had the year or year and a half background study that we have had, it is impossible. I think we will have to face it. It just can't be done; I don't see how it could be done.

On step 2, the government recommends that we have complete financial arrangements by December 1, 1960, and they said on the stand that they interpret that to mean a successful bond election will do that job. I think by great odds the City of Kansas City, Kansas, can have a successful bond election by December 1, 1960. It is not certain. We can't tell what the public opinion will be. We have our schedule to go, but we are thinking of the contingency of an unsuccessful bond election. We are trying to think of every possibility.

If we have an unsuccessful bond election we are in a position to go to the state legislature in January when they convene and ask for a bill immediately giving us authority to issue revenue bonds without an election, and we almost got our law passed in the last session of the legislature with that provision. That provision went through the house and it was about to go through the senate and then a senate committee caught it and put in the usual provision that it had to have the approval of an election. I don't think there is any doubt that our state legislature will give us that if we don't have a successful bond election.

Again I think we are in a much better situation than other communities in our district, and to ask all the communities in this metropolitan area to have complete arrangements for finances by December 1, 1960, I just can't see that it is realistic.

There is no question about it, a crash program of financing by a municipality costs more than one that you can take your time with, take a little time with. Many things can come up. We might want to wait a month or two months to get a favorable market for our bonds. Our financing has been figured on a three and a half percent basis and we have been able to sell revenue bonds that cheap and we hope to again, but if the bond market is not right we may want to wait a few months to sell our bonds and this could save our taxpayers thousands of dollars.

Something was said here that indicated that it was a substantial financial burden, but when you got down to the per capita it only amounted to about $1.28 a head in Kansas City, Kansas. I got out my water bill this morning and computed very rapidly--

MR. SAMSON: You mean $121, don't you?

MR. BRENNEISEN: $121, yes, per head. I got out my water bill this morning, there are three in our family and I don't use any gardening water or I haven't used any, nothing except the usual domestic water, and my bill will be two and a half on my water bill, my sewer bill will be two and my sewer bill will be two and a half a month, which will make about $900 for me to help finance the first phase of our program. And when we include the second phase, too, you have to add about another $400. So for an ordinary family in Kansas City, Kansas, with the industries paying their full share, it is going to cost an ordinary family in Kansas City, Kansas, $1,300 over a thirty-year period. So we are talking about financing that is such that we should be able to take every advantage of lowering the cost if possible.

Now, the schedule set out in No. 4, January 1, 1961, to instruct the engineer to proceed with final plans and specifications, that is the first of this year and it is almost on us. Kansas City, Kansas, has a contract with an engineer to do this work, but the contract provides they shall not furnish the final plans and specifications for any one of the steps until they have been instructed in writing so to do. Now, in every engineer's contract that we have had with the city the big problem is that paragraph that comes towards the end of the contract that says the engineer for such services shall be paid so much as follows, and under our laws and under, I expect, every other municipality's laws the city, in order to sign such a contract, has to have the cash on hand or they have to have the funds available through a bond election.

We had this situation. In the last 18 months we had a bond election under a new law, and this is a new law we are operating under. The bond attorneys approved the law before it was passed, they said it was good and said our bonds were good, but the mayor, before we can sell a bond, has to make a little certificate that we have no suits pending against us threatening the authority to issue this bond, these bonds. Not only that we have no lawsuits against us but we have no lawsuits threatened against us.

We ran into this situation. We got a letter from a taxpayer's attorney telling us that our law was no good and was unconsitutional and he was going to fight it in the courts. The mayor could not make the certificate. We had to ask the Secretary of State to challenge our authority to issue the bonds and we had to carry the case through the Supreme Court to have the bonds approved before we could sell them.

Now, those are contingencies that can come up and can come up particularly under a new law and a situation of this magnitude.

Section 5, final plans and specifications completed by January 1, 1962. That gives us a year after this other, that gives the engineers a year after this other date to complete the plans and specifications. This is crowding too much. Too many things can happen in an engineering project of this size. You saw where the engineer pointed out all these interceptor sewers. It means a tremendous amount of condemnation proceedings, for one thing. We can anticipate that when we get into our condemnation we are going to find that where the engineer from a purely physical standpoint thinks it would be practical to put a large interceptor sewer that when we get into it we can find that in condemning that that it is not going to be practical from the financial standpoint. The engineer is going to have to change plans and specifications. We run into that on just ordinary projects, but with a project of this size there is a certainty we will run into a lot of it.

I am not so much concerned with the six months between the time that the final plans and specifications have to be completed and when the contract is let. We can let a contract within about a month or six weeks after they are completed and I doubt whether it would take a board five months to approve plans and specifications. I think that time could be cut down some. But I think the first date should be extended.

MR. SAMSON: What is your idea on how far it should be extended?

MR. BRENNEISEN: I think we should have a year and a half from the time it is practical to tell the engineer to start on the plans. I think there should be a year and a half there.

MR. SAMSON: That is where, now?

MR. BRENNEISEN: 5. I think it should be a year and a half after 4. Of course I think 4--

MR. SAMSON: That would bring it up to what date, Mr. Brenneisen?

MR. BRENNEISEN: Well, I think six months should be added to No. 4 and six months to No. 5, which would make it January 1, 1963.

CHAIRMAN WILSON: Mr. Brenneisen, will you just summarize now and give us the date for each one of those separate steps, beginning with No. 1 and going down through them all, give us the dates which you consider to be realistic and reasonable.

MR. BRENNEISEN: I think the first date to be realistic from our standpoint in Kansas City, Kansas, should be November 15, 1960. That is item No. 2, November 15, 1960.

CHAIRMAN WILSON: What is No. 1?

MR. BRENNEISEN: No. 1 is the general statement.

CHAIRMAN WILSON: Oh, I see. No. 2 is the first specified date, that is right.

MR. BRENNEISEN: No. 3--

CHAIRMAN WILSON: And you think that should be November 15, 1960?

MR. BRENNEISEN: Yes, sir.

MR. JOHNSON: November 15th or 1st?

MR. BRENNEISEN: Well, about the 15th. I think it should come after the bond election. Our bond election will be the first week or the second Tuesday in November.

MR. SAMSON: You have got a legislative problem if your bonds don't go, so what is your suggestion with No. 3?

MR. BRENNEISEN: I would say July 1st. That would give us time, if a bond election is not successful, to go through the legislature.

MR. SAMSON: That is July 1, 1961?

MR. BRENNEISEN: 1961, yes.

MR. SAMSON: What do you say as to No. 4?

MR. BRENNEISEN: No. 4, I would say July 1, 1961.

CHAIRMAN WILSON: You mean the same as No. 3?

MR. BRENNEISEN: I mean 1962. Pardon me.

MR. SAMSON: No, that is a year and a half up to the schedule.

MR. BRENNEISEN: No, July 1, 1961, about the same as the-- If we get our financing straightened out we can instruct the engineer.

MR. JOHNSON: Nos. 3 and 4, July 1st?

CHAIRMAN WILSON: Completion of financing, and you suggest for that July 1, 1961?

MR. BRENNEISEN: And the other date about--

CHAIRMAN WILSON: No. 4 is the instructions to the engineer to proceed with final plans and specifications.

MR. BRENNEISEN: About the same date. If we get our financing completed, we can tell the engineer to go ahead.

CHAIRMAN WILSON: All right, how about No. 5?

MR. BRENNEISEN: I think we should have a year and a half to complete our plans, which would bring it to January 1, 1963.

CHAIRMAN WILSON: And No. 6, putting under contract?

MR. BRENNEISEN: No. 6 worries me a little bit. Everything under contract for all remedial works. I am not sure that I can tell my governing body what you would mean by all remedial works. Maybe we would be in a better position or a governing body would be in a better position later on if that wasn't well defined, but to know just exactly what you expect of us, I wonder if that should be defined as some specific objective, that we are supposed to do so and so on such and such items of construction.

I don't know whether we would be able to do that or not, but just a thought. I think we could have everything under contract if we completed our plans by about January 1, 1963, and get them approved by the State Board of Health in a couple of months and then maybe two or three months more, about July 1, 1963.

MR. SAMSON: The same date as No. 5, then?

MR. JOHNSON: No, that is January.

MR. BRENNEISEN: No, that is about six or seven months after that.

CHAIRMAN WILSON: Then you would suggest July 1, 1963, for No. 6?

MR. BRENNEISEN: Yes, sir.

MR. SAMSON: Instead of July 1, 1962?

MR. BRENNEISEN: Yes.

CHAIRMAN WILSON: So that with these previous additions, it would set that step a year later than it is here proposed?

MR. BRENNEISEN: Yes.

CHAIRMAN WILSON: Can you suggest any portions of the project which you think might take longer time than others to put under contract?

MR. BRENNEISEN: Well, we hope to plan ours, to schedule it. We don't want to let one contract for the same thing within three or four months. We want to schedule these interceptor sewers and this treatment plant at different times. We think the work would be too much for our contractors in our area. We think we could do better financially by scattering it out a little bit. That is going to be subject to engineering study and financial study to see just how to schedule it, and I couldn't tell you at this time.

CHAIRMAN WILSON: Would this spread of six months between the completion of plans on January 1, 1963, and the requirement for getting everything under contract by July 1, 1963, give you sufficient leeway in there?

MR. BRENNEISEN: I think that will give us sufficient leeway, because I believe that part of our plans and specifications would be completed before that date and part of the contracts let before that date.

CHAIRMAN WILSON: What do you think would be a reasonable time for final construction after the letting of contracts?

MR. BRENNEISEN: A minimum of two years.

CHAIRMAN WILSON: How much?

MR. BRENNEISEN: A minimum of two years.

CHAIRMAN WILSON: Any other questions, gentlemen? Go ahead, Mr. Brenneisen, if you have anything further.

MR. BRENNEISEN: I have one further thing to say about this, just a thought.

We are under orders of our State Board of Health, I think it has been brought out here, to meet a schedule. The State Board of Health meets quarterly, they have regular meetings quarterly. They can call special meetings. In our hearings with the State Board of Health it has been indicated that they are meeting quarterly and can have special meetings and they can alter their schedule or order for us if contingencies come up. That is, we are under order but we also know that we can go to them with a reasonable showing and have that schedule changed.

I believe this Board is a little different than that. You are going to make an order and that is going to stand. You are not going to be back here in session three or four months to hear us tell you why we couldn't meet such a schedule, and under those circumstances I think you should consider that if you try to judge your orders from the State Board order.

Really, I think the mechanics of a State Board, either from Missouri or Kansas, that that is the place to enforce this. I think it has been demonstrated that both Boards are very aggressive in this matter and I think any schedule you set out should be very realistic in allowing any governmental unit in our area here to follow. If the State Board thinks that your order is not strict enough for any particular governmental unit, they can make that order and they have authority to enforce it, even though your order would give the unit more time. And I think that should be considered.

CHAIRMAN WILSON: Kansas City, Missouri?

MR. KOENIGSDORF: Mr. Chairman, at this time before I forget it, I would like to respectfully request of the Board that as to Kansas City, Missouri, the Board make specific findings of fact and conclusions of law under the Federal Administrative Procedure Act. I assume that will be in the record.

Mr. Chairman and members of the Board, Mr. Powers and I on behalf of Kansas City do sincerely appreciate the quality and outstanding character of this Board. I know you are all able and conscientious men. I don't say that in the way of flattery, but it has made it much easier for us to work in this hearing because it has been handled in a very dignified and orderly fashion. I appreciate the Chairman's keeping the tempo and the tenor of the meeting at a high level at all times.

I would like to compliment Mr. Stein, Mr. Edelman, Mr. Hopkins and Mr. Clare for all they have done in preparation and putting on this evidence. Also I think the many government witnesses who appeared, who appear to be eminently educated, should be complimented for their devotion to their duty.

Let me say at the outset that Kansas City, Missouri, or Mr. Powers or I are not in disagreement with the Board or with anyone in this room, I am sure, as to the question of the desirability of abatement of pollution in our rivers. The city council, all nine members, including the mayor, have so publicly indicated, that they are in sympathy and in favor of the plan of pollution abatement.

I don't think we should have been in this lawsuit or this hearing, or whatever it is, because of a number of jurisdictional things, but since we are here and we are ordered to come in, as attorneys for the city we have raised all of the technical objections that we thought were proper to raise. In other words, regardless of our basic point, that we agree on the fundamentals, still the things that we have raised and the actions that we have taken here, I am sure you appreciate that, are because it is our duty to protect the city as to all of its legal rights.

On Exhibit 18, I know we are familiar with it and I know that this might be a little repetitious, but I want to emphasize, if I may, to the Board that the only sewer that Kansas City, Missouri is interested in or I think the Board is interested in in relation to Kansas City, Missouri, is what is known as the Turkey Creek-O.K. Creek Sewer. This is a most unusual situation. I don't know of any other place in the country, maybe you will find one, but most unusual in that here sewage originates in one state, the State of Kansas--now, I don't mean all of it, but I mean a portion of the sewage originates in one state--goes over into another state, the State of Missouri, comes back to the state line and then does not dump into any river at the state line, it dumps into a river within a state, within the State of Kansas, and goes down to the mouth of the Missouri and then the next state that it touches again is the State of Missouri. A most unusual situation. Originates in Kansas in part, goes through Missouri, picks up Missouri sewage, goes back into Kansas and over into a river which is totally within the state boundaries of the State of Kansas.

I am not going to enumerate again all of the jurisdictional problems that we think are involved. We have made several motions and included several things, but the government indicated in argument that the matter of jurisdiction was of import as far as they are concerned and I assume that this Board, if it were so inclined, could recommend to the Director of Health and Welfare or the Surgeon General that no action be taken against a certain community because they did not believe that it came within the bounds of the law as is applicable here.

I would like maybe just to get something off my chest, more than anything else, on the original one; I want to say something about due process. Kansas City, Missouri, through its counsel believes that due process is being denied to cities such as Kansas City when we are required to come before--and I have no criticism of this Board--but to come before a board which constitutes the court and jury which is selected by the other side, so to speak, in a lawsuit and present a case. And that is what we are doing here. The Board has been selected by the government, through the Act, and we are here as just the other side. I don't, as you know I don't, infer anything against this Board or feel that this Board would not do what they thought was right, but we have the right when any agency asks the City of Kansas City to spend twenty million dollars for any particular thing, in my opinion, to go before a court of law which is separate and apart from the Health and Welfare Department, let the court see, as this act does not provide for, the witnesses who appear before the court, let the court determine the truth or veracity of the witnesses, let the court determine whether their manner upon the stand is convincing or not convincing. The court has many things that can be gained from watching a witness upon the stand at the time that a case is presented.

Now, the second item--I am not going through them all, as I say--is this question of jurisdiction as to the Kansas River and Turkey Creek Sewer.

Do you have the oath that you presented to the witnesses?

This is not binding upon anybody, but I think it indicates the confusion that exists in the minds of many people as to this Turkey Creek Sewer. It says, "Do you solemnly swear the testimony you are about to give as a witness at the public hearing concerning pollution of interstate waters of the Missouri River and Turkey Creek Sewer", indicating the fact that there is considerable doubt about where Turkey Creek Sewer fits into this interstate waters problem.

This act is punitive or penal, as I understand it, in its eventuality and, therefore, must be strictly construed. Section 466g, and I only have the Code Annotated to refer to, Title 33, says that "Pollution of interstate waters in or adjacent to any State or States" and then it goes on with some definitions of that. But if you will look at Exhibit 18 you will see that the Kansas River is wholly within the boundaries of Kansas. That is not a border river, doesn't create a boundary; wholly within Kansas. Missouri through its sewer system goes into Kansas and within the state deposits within the Kansas River. Then that river goes up to the Missouri, still within Kansas, comes back to the State of Missouri.

I don't think that the law, as it is written, will cover Kansas City, Missouri, and the Turkey Creek Sewer. I think maybe it was an oversight; I don't know what it was. Probably nobody ever thought of a condition existing like this. But the fact that it does exist is one that takes it outside of the law. We are not included within the definition.

This is technical, I will admit, and it doesn't get what we are talking about. We all agree there should be pollution abatement, but we are here as lawyers and these are the points that I wish to make to you.

Now, this is another one to kind of get it off my chest. This act is, in my opinion, discriminatory as to cities the size of Kansas City. As I think you all are aware, the act provides that half of the fifty million dollars which is provided for in this act, as I understand it now, must be spent upon cities of less population than 125,000. Then it goes further and it says that no municipality for a project shall have over $250,000 or one-third of the cost of construction, whichever is lesser. That means that Kansas City, Missouri, with a twenty million dollar project, if it be one project, and I am not sure if it is or not as of now, would get a maximum of $250,000 in federal assistance in building that sewer and a smaller town that would have a $750,000 project could get $250,000. It is not fair, it isn't just, it isn't equitable, and it is discriminatory against cities such as Kansas City.

You know, times have changed a little bit. It used to be we had some money in the communities to spend for these services. At one time I think the city had about 70 percent, the federal government about 30 percent. Now it is completely reversed. The federal government takes 70 cents of every taxable dollar or a little more and leaves us 30 cents on which to operate our schools and take care of our counties and cities and do all of our necessary things, and then comes in, after taking the money back to Washington, says "You can only have $250,000 for your projects of your money which you need to do things that we want you to do."

There is one further thing on jurisdiction that I would like to mention very briefly and that is, the testimony was and is in the record that the Missouri State Pollution Abatement Board has had before it a resolution No. 25110 of the city council of Kansas City, Missouri, providing for a method of financing, providing for a vote of the people to determine whether that should be done, providing for a time table for the abatement of pollution within the total Kansas City area, including the Turkey Creek Sewer, and that time schedule was, as I understood the evidence, adopted by the pollution abatement or control board of the State of Missouri. I can't reconcile this proceeding now, and I know that the evidence showed that a representative of the government was aware that the State Board had taken such action, I can't reconcile that with the portion of the act--excuse me just a second. Well, I referred to it before and I could find it again, but I think you know the provision where the federal government will not proceed--is it 466b?

MR. STEIN: Here it is.

MR. KOENIGSDORF: All right.

Section 8(b) of the act provides that "consistent with the policy declaration of this Act, State and interstate action to abate pollution of interstate waters shall be encouraged and shall not, except as otherwise provided by or pursuant to court order under subsection (g), be displaced by Federal enforcement action." I think that means that when the state has taken action and set a program for a city within that state, that federal action is then forclosed.

I am going to try to limit this as much as I can and I am not going to take much longer, but because you have listened very carefully to the evidence as it was presented I am not going to mention names or pick specific points. You will remember it as well as I on matters that might be included. But I want to get back to Turkey Creek just a minute on problems. Suppose you do go ahead and say that Kansas City, Missouri, should set up a treatment plant for Turkey Creek Sewer at, I think the evidence was, the Kansas River. I wonder if you appreciate the problems that Kansas City, Missouri, would then have? I wonder if anyone could tell me how Kansas City, Missouri, has the right to acquire by condemnation land which lies in another state? Maybe the federal government can help us, I don't know, I mean if we do it that way. I don't know of any provision for them to. Maybe there is one, but it would be most unusual if we with our funds had the federal government acquire land in another state for us to use.

Mr. Brenneisen and I probably would get along all right, but I wonder if you can tell me how we can force Kansas City, Kansas, and Kansas City, Missouri, to reach an agreement upon something. Mr. Hopkins says he thought it was fine and everybody would do it, but we know there are a lot of practical things that enter into it when you try to get two municipalities to enter into a contract on something.

I wonder if you or anyone could tell me how we can plan for sewage treatment in a sewer on which we don't control the number of hook-ins, where Kansas City, Kansas, has the right to hook in either in the State of Missouri or in the State of Kansas, into the Turkey Creek Sewer.

I am sure you realize that there is an expense of maintenance and operation of a sewer treatment plant. I wonder if anyone could tell me how we could acquire from Kansas City, Kansas, or the residents thereof a proportionate share to pay for the cost of maintenance and operation of our treatment plant.

These are not simple matters. You say do it and we get involved in these things that I am bringing to your attention.

We couldn't even control the type of sewage that went in when we plan treatment. I don't know of any industry that is over there in Kansas in that area, but I suppose it is conceivable there would be one, that would put sewage into the Turkey Creek Sewer from the State of Kansas with chemicals and other things in it.

MR. SAMSON: Mr. Koenigsdorf, right at that point, doesn't the contract, the exhibit that you introduced in evidence, have some definite specific provisions as to the control which you exercise as to what goes into the sewer?

MR. KOENIGSDORF: That is a question of approval of plans, if I understood it correctly, and I don't believe by plans you mean the type sewage so much as the engineering that would go into it. That would be my--

MR. SAMSON: You are more familiar with the exhibit than I am. I just casually looked at that as we were sitting here and I felt from the general terms that you had a lot of control over the sewer, from the exhibit.

MR. KOENIGSDORF: Well, as I understand the law, we couldn't unreasonably withhold permission if they came up with satisfactory engineering plans that would hook into the sewer.

These I am going to run over very briefly. The evidence, as I said, you heard along with me and I know paid close attention to it. Just as an over-all observation, it appeared to me that a great, great amount of the evidence was highly speculative and conjectural. And I speak again about court hearings, but people have quoted figures that they based upon figures of people who based upon figures, they have transposed them I don't know how many times, they come in with summaries of this made from summaries of that, and I don't know how you can come to an accurate conclusion based upon that type of evidence. I know they mean well, but I am talking about these things just--there is just too much left up in the air in all this evidence that I have heard.

Cumulative. Maybe it amounts to a lot; that would be up to you to say. I am not saying that there isn't evidence that was somewhat substantial. I think that in this case, though, since it is punitive, you have to place a strong burden of proof upon the federal government.

I know that Mr. Stein could take a long time and answer these things I am going to say about the evidence because he had things on the other side, and I will concede it without going into it. There were other things. But let's take a few of the things that are included that maybe you should consider two ways.

Now, we have that fishing, boating, swimming, water skiing, wild life. In the first place, much of that is not applicable. The act provides under the enforcement section that it shall be the health and welfare of persons. Now, that is distinguished from that portion of the act, 466a, which provides for plans, and in that section which provides for cooperation between states and federal they mention fish and aquatic life, and so forth, when they are working out plans with the state government. But I think Congress recognized that they can't control that when it comes to the enforcement provision and specifically left it out of 466g.

We had one fellow who wouldn't admit that the fish tasted bad. He said he loved the Missouri and regardless of what other people said he thought the fish tasted all right, nobody could say they didn't, and I am on his side right now.

MR. JOHNSON: Have you eaten any of that fish lately?

MR. KOENIGSDORF: No, I haven't. I have never been swimming in the Kansas River in my life, I have never eaten any fish from it that I knew of, and I have never been water skiing anywhere in my life.

But the state in these cases apparently assumed jurisdiction. I say the State of Missouri, this is as to the Missouri River, but they have issued licenses and have conservation people who control the operation upon the river. The testimony was that there were numerous lakes within a day's drive of the community. There was testimony that one man and his group are going to build a $750,000 marina here, regardless of the condition of the river. There was testimony that Uncle Sam in controlling his dams gave fishing and boating and recreation area a very low priority. They won't let water come down for this purpose. Their purpose is primarily for navigation, and so forth, and if it came to saving fishing and boating, and so forth, the priority is way down the line, as I understood the evidence.

Taste and odor problem. We had an unusual thing in that a very capable expert stated that a great bit of that might have been caused by these dams that the government itself put up in the river to control the silt that comes down and helped to create algae, which are taste and odor producing factors within the river.

On health, I was amazed that the government did not see fit to make an analysis of the products of the river as to pathogenic organisms. It just seemed inconceivable to me that all we would go upon is B coli or coli count, which everyone has stated might be injurious to very small infants in certain phases, but otherwise not at all, inconceivable that they would not make a test to determine the pathogenic organisms which might actually cause harm to the health of people of this community.

All the government witnesses testified they never heard of anyone who got sick from drinking or swimming, boating, and so forth, in the Kansas River, and I think even went further to say in the Missouri River. There was one man in here and I think his testimony is highly questionable as to whether he got typhoid fever from the river or he said he might have gotten it out of the dump, he didn't know where the water was that he drank, it was close to the river and he kind of thought it was the river, and three weeks later he got typhoid and nobody knew where he was in the meantime or what water he had drunk elsewhere. It was his conclusion that he had gotten typhoid from the river.

I am going to cut out a couple of points here. I think you will remember them all. But we got to the end of the case and we had a little hassle here about the ability to finance and Kansas City, Missouri, objected to the testimony of the witness that we felt was not qualified to testify as to the financial ability of the city. We think that objection was well made and that the evidence whould not be in, but even if his evidence went in, and it is the government's responsibility to introduce it, this Board does not have sufficient information as to the finances of Kansas City, Missouri, to give a time schedule to Kansas City, Missouri, to construct anything that will cost whatever the amount is for Turkey Creed. Mr. Powers asked some very simple questions which would enter into the financial picture of a city of this size in making an expenditure like is requested, and unfortunately the government witness could not answer them. I don't know how you can speculate as to what those answers would be. And the burden is upon the government, not upon Kansas City, Missouri, to present its case.

I am going to stop right there, except to say this, that Mr. Powers and I are sincere on behalf of Kansas City, Missouri, in our claims as to technical matters that we have presented to you. We think that they are well founded and we think we should not be in here at this time. However, we also sincerely hope that before this whole thing is over with, regardless of orders or what happens, that it is all worked out to the satisfaction of all concerned and that pollution is abated, technicalities notwithstanding.

MR. SAMSON: Before you sit down, I have a couple of questions I would like to ask you. Or you can sit down and answer them, that is all right.

Mr. Koenigsdorf, as I understand it, it is your definite position that Turkey Creek does not constitute interstate waters?

MR. KOENIGSDORF: I cannot see how it comes within the definition. Of course, there is no Turkey Creek. It is the Turkey Creek Sewer.

MR. SAMSON: That is what I am referring to, on Exhibit 18.

MR. KOENIGSDORF: Yes, sir.

MR. SAMSON: Then what is the city's position, then, on the Kansas River?

MR. KOENIGSDORF: Well, we don't think that the act applies to Turkey Creek Sewer.

MR. SAMSON: I see. Then what is your position on that part of the Missouri River from outlet or outfall C-6 back to the curve that is at the very junction of the Kansas River--

MR. KOENIGSDORF: Well, it was deposited into an intrastate water as far as Kansas--it goes strictly within the limits of the State of Kansas up to Missouri. It is entered in Kansas, carried by a Kansas River, as far as we are concerned, and comes back into Missouri, entered only in Kansas.

MR. SAMSON: Is it your position that that little stretch of water right there from outfall C-6 back to the confluence is a part of the Kansas River or part of the Msssouri River?

MR. KOENIGSDORF: Well, it is part of the Missouri River, but this flow entered within the State of Kansas.

MR. SAMSON: I see. Thank you very much.

CHAIRMAN WILSON: Do any counsel desire to present arguments for North Kansas City, Missouri? I hear none.

Do any counsel desire to present arguments for the Fairfax Drainage District of Kansas?

Do any counsel desire to present arguments for the Kaw Valley Drainage District of Kansas?

Do any counsel desire to present arguments for any of the industries named in the notice or any other parties who entered appearances at the hearing?

Mr. Elson.

MR. ELSON: I don't think I will take more than about a minute, but first I want to echo the sentiments of other counsel as to the indulgence and careful attention of the Board. We appreciate the opportunity to appear before you and we also join in the observation that the technicalities, of course, should not overwhelm the ultimate solution of the problem. The question is what is the proper legal procedure for achieving the result.

All that I really want to say on the substantive side is that we are in complete agreement with Mr. Brenneisen's comments as to the necessity of spreading out this suggested time schedule in a relatively moderate fashion and, if possible, putting in some provision for flexibility in the event of unforeseen contingencies.

Specifically the one step with which Swift and Company is involved is in the proposed September 1, 1960, date for advising the city of the volume of and characteristics of our discharge if we want to go into the city system. As we have indicated in our statement, we and the other industries prefer, if there is no cost penalty, to come into the city system. We think from every point of view that is the desirable result. But the fact of the matter is, at this moment and time there is a very material dollars and cents difference of opinion between the city and the industries as to what it will cost to take care of our wastes, which, of course, affects what our annual charges will be.

As indicated, there are meetings set up in July with the state people, the consulting engineers for the city and for the industries in the stockyards area, there are meetings set up with the city and public hearings on the city's sewer service charge ordinance, and it looks completely unrealistic to us to think that with meetings still under way in July on subjects where there are rather substantial dollars and cents differences that we can resolve and come to the end point, the ultimate figure that the city on the basis of its studies and its engineering advice can give us as a proposed charge, and then take it back and review it and reach decisions within our organizations within that kind of time.

Last night, I believe, in response to your question, Mr. Samson, I suggested 60 days, which would be November 1st. I think that Mr. Brenneisen's November 15th is even more realistic and desirable, because I think that there could be some weight that ought to be given in the ultimate decision on the outcome of the bond election which they now have scheduled, as I understand it, for November 8th.

So we would respectfully submit in fixing a time schedule, if it is the Board's conclusion that they are going to order a time schedule with respect to Kansas City, Kansas, and its industries, that there be more time fixed as suggested by Mr. Brenneisen at all steps and particularly for Swift in what I believe is paragraph No. 2, which is really the first step.

Thank you.

CHAIRMAN WILSON: Does any other counsel for parties wish to present arguments?

If not, the government may present its rebuttal, if it has any.

MR. STEIN: Thank you, Mr. Chairman. We appreciated the considered comments of counsel for other parties in this case and we appreciate their point of view. However, we would like to point out several things.

While we sympathize with groups and industries always wanting a longer time schedule, we feel constrained to call the Board's attention to the time schedule submitted by Mr. Metzler of Kansas in connection with this hearing where he stated that the Kansas State Board of Health adopts the schedule submitted by the City of Kansas City, Kansas, as follows, and he listed some specific dates. Before this Board now Kansas City, Kansas, comes forward with a time schedule which is longer than the one they submitted to the State Board of Kansas and which takes more time than was accepted.

Now, I think we have to approach this in the reasonable manner and we have to try to be consistent. This evidence was presented before the Board and presented before them under oath.

The second point I want to make in connection with the time schedule is that if a time schedule adopted or recommended by this Board and by the Secretary of Health, Education and Welfare is not followed, the next step is up to the Secretary of Health, Education and Welfare. The Congress debated this issue very, very carefully and decided that the placing of this next step was to be vested in an officer of the federal government of cabinet rank. They did this for a specific purpose. The next step is not mandatory. The Secretary can exercise discretion in this operation.

Now, I think again when you speak in terms of coming before a Board in Missouri or a Board in Kansas, we have had several Secretaries, and I am sure that our Secretary is available just as well. I don't think we are dealing with any absolute rigidity here. However, I would hope that we might be consistent.

Now, I would like to, if I might, turn to some of Mr. Koenigsdorf's points. One, Mr. Koenigsdorf mentioned the administrative procedure act as applicable to this hearing. I think by and large the evidence we have presented, if you consider it subject to connection, meets the requirements of the administrative procedure act. However, the administrative procedure act does not apply to this type of hearing. This is a statutory hearing coming up with a recommendation. The administrative procedure act comes up with a hearing requiring orders of a Board.

Now, there was a considerable comment about jurisdiction. Again I would like to go over the statute and go over it very carefully. I read the full section of the statute when I started, Mr. Koenigsdorf read part of the section, and I would like to pick it up again and read it as it says. Mr. Koenigsdorf read about pollution of interstate waters in or adjacent to any state or states. The statute goes on to say: "Whether the matter causing or contributing to such pollution is discharged directly into such waters or reaches such waters after discharged into a tributary of such waters."

Again let us look at the map, Government Exhibit No. 18. We think it is clear that the Missouri River in the portion between Missouri and Kansas at the confluence of the Missouri and Kansas Rivers is an interstate water. We think it is clear that the Kansas River is a tributary of an interstate water. We think the evidence here has established beyond any peradventure of a doubt that the pollution from this area, combined with other pollution, reaches the interstate waters of the Missouri River and persists down past St. Louis into the Mississippi. Those are the pollution loadings we are dealing with, not ephermeral conjecture.

The next point Mr. Koenigsdorf raised was something on due process and I don't think this is the place to go into these statements about administrative boards being judges and jury. I think the Board is familiar with them. This is the type of argument that has been applied to this type of procedure for the past thirty years. We appreciate the views of Mr. Koenigsdorf on this matter. However, I think the court cases in this area are abundant and pretty clear.

I don't think that there is any confusion about the Turkey Creek Sewer on the part of the government and I don't think that we have any trouble in reading the oath prepared by someone on the Board for administration to the witnesses as we read it. It seems pretty clear to us that interstate waters applies to both the Missouri River and Turkey Creek, and the inference might be that this was taken from the heading of the hearing notice as promulgated by the Secretary of Health, Education and Welfare in calling the hearing.

The next point Mr. Koenigsdorf makes is the provision of our act dealing with construction grants to municipalities to aid them in the construction of municipal treatment works. This section of the act is completely independent from the enforcement provisions of the act. It has absolutely nothing to do with it. The fact that a community is cited under the enforcement provisions of the act in no way makes it eligible for a grant. The procedures for the grant are established in that section and, among other things, the community has to receive priority from a state based on financial as well as water pollution control needs. As a matter of fact, the position of the administration has been to eliminate this. Mr. Koenigsdorf thinks we should expand it. I don't say that we do not have sympathy with Mr. Koenigsdorf's view and we certainly would like to see him pursue his view, but I think his remarks should be directed to the Congress rather than this Board.

Now, in addition Mr. Koenigsdorf, as well as the counsel for Kansas City, Kansas, has indicated many, many reasons why the schedules could not be reached and here we have conjecture, speculation. One, that the Turkey Creek Sewer would require them to acquire land by condemnation. There is no showing that an attempt has been made to get a site in Kansas or that they would have to condemn. There is no showing that that is the only site. There is no showing that the plant can't be built right on the Missouri side of the line and an outfall running into the Kansas. This is not a unique problem where communities on the state line have worked out their sewage problem in an equitable fashion. I think some of the Board members might be familiar with the Beloit, Wisconsin, case where the sewage treatment plant had to be put in another state. I think about the Lakehurst, New Jersey, case where the borough had to put its treatment plant in another borough. These things have been worked out in the past and they are being worked out now.

We even have a more vexing problem on its way to solution right now of the same type dealing with wastes from Tijuana, Mexico, and San Diego, California, and if we can solve these international problems I am sure that a problem of site location for a plant here is not insurmountable. Other communities have demonstrated that they can do it.

Again Mr. Koenigsdorf mentioned that when we deal with competition for waters for fishing, wild life or recreation we are not necessarily dealing with the welfare of persons. With population increasing and the demand for recreation increasing, Americans having more and more leisure time and going out and seeking recreation, seeking places to fish in clean water, I don't know what could be considered to be more the welfare of the people than providing a man an adequate place to fish or boat near his home and take his son out with him in an evening or on a Saturday or a Sunday afternoon, and I don't know why, if this wasn't welfare, the Congress saw fit to put it into the Department of Health, Education and Welfare.

Now, Mr. Koenigsdorf--and these are just short answers to specifics—mentioned that there were many lakes within a day's drive. I think the testimony has shown that there are very few lakes within a day's drive. One of the lakes is private and limited to ten horsepower boats; most of the lakes are too small to take on power boats. There are 25,000 power boats in the Kansas City area.

I also think that the man who talked about the marina has indicated that clean water was really a vital part in his consideration of constructing the marina.

Mr. Koenigsdorf talked about the very low priority in federal installations and dams for fishing and recreation. I don't think there is a low priority. I just think it is good sense not to substitute dilution water for proper treatment by cities downstream. Talk about the federal government and the public expense. These large multiple-purpose projects are designed to preserve every drop of water and are run on a scale that the communities can handle these problems themselves, but here we have a question of sewage treatment which should be undertaken by the initiative of the individual community. I do not think it is the function, and I don't know anyone who has proposed that it is the function, of the federal government to provide storage water and release it to help the cities flush out their wastes when they have made no effort to treat those wastes themselves.

Again Mr. Koenigsdorf is amazed--amazed--that we produced no evidence on pathogenic organisms in the water. What were adduced here were standard methods which indicated the existence of pathogenic organisms. Again these methods are the ones used by all types of scientists to determine the existence of these organisms. Mr. Koenigsdorf talks about raising the federal grants for cities or the large federal expenditures on the one hand and on the other hand asks us to spend the money to try to isolate pathogenic organisms way and beyond the methods developed by standard methods.

Mr. Koenigsdorf talked about a man who got sick, and just for the purpose of the record, he got sick two weeks after he drank that water, I think he said, not three weeks. This was an error, because the three-week period is even in the upper limits of the incubation period for typhoid.

We talked in terms of the financial capacity of the city to build a sewage treatment plant. I think Mr. Hopkins' testimony was explicit on that point related to the financial capacity of revenue bond financing for treatment works and contained the relevant information. It seems to me on the basis of this relevant information that the financing of this is so far within the capabilities of Kansas City, Missouri, that there seems to be very little question about it. I should point out that in 1957 the mayor came forth with a plan, this wasn't us putting the arbitrary time schedule, and said the city could do it within that plan. I think the time schedule propowed by the government at this point is about comparable. And again I ask you to look at the genesis of this plan. It came from the city, from the mayor, after consultation with the council, as he said, after long and prayerful cogitation and thinking.

We do have just one more point and that is the plan that Kansas City indicates it has taken, the pay-as-you-go plan and the action it has taken. I would like to point out that the state has not issued any formal order against Kansas City, Missouri. What we have here is a promise by Kansas City, Missouri, in negotiating the promise, and this is what they were negotiating, the promise. The state in a resolution said that Kansas City was not to have any further sewerage extensions. That came out on June 1st. Kansas City, Missouri, with all its protestations of good faith on June 3rd passed an ordinance authorizing two subdividers in defiance of the state to extend sewers and connect to the system and create additional pollution.

This always presents the question of what the Board will do. When we were here in 1957 we were faithfully promised by the mayor of the city, who pounded the table and his voice boomed out and he promised, that the city would adhere to the schedule. It is now 1960 and the schedule has not been adhered to. I think this problem has come before boards and courts many times. There are numerous citations covering it and I would like to close on this point by just quoting a famous citation in a case analogous to this in United States against the Oregon State Medical Society, 343 U.S. 326, where the Supreme Court said, "It is the duty of the courts to beware of efforts to defeat injunctive relief by protestations of repentance and reform, especially when abandonment seems timed to anticipate suit and there is probability of resumption."

Thank you gentlemen.

CHAIRMAN WILSON: Are there requests from any other counsel or parties present for further opportunity for argument now?

If not, I am about to adjourn the public hearing, but in that connection I should like to make an announcement. The Board will convene after the hearing in executive session at its meeting room at the Pickwick Hotel at 11 o'clock for deliberation upon its findings and conclusions, and I wish to announce for the information of the public and the press that no public announcement of the findings and conclusions of the Board will be made prior to their submission to the Secretary of Health, Education and Welfare. That is in accordance with the practice that has always prevailed at hearings of this kind and in other similar government procedures. The Board is required to make its findings and recommendations to the Secretary and the release thereof is entirely in the hands of the Secretary.

With that explanation, this public hearing will now finally adjourn and the Board will convene in executive session at its meeting room at the Pickwick Hotel at 11 o'clock.

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REPORTER'S CERTIFICATE

I, Virginia Hough Rankin, do hereby certify that I was present and the time and place first hereinbefore set forth, the aforementioned parties appearing, that I took down in shorthand the entire proceedings had at said time and place, afterwards transcribed said shorthand notes, and that the foregoing pages constitute a true, correct, and complete transcript of my said shorthand notes.

Shorthand Reporter

SUPPLEMENT 1

NOTICE OF FINDINGS

AND

ORDER FOR

POLLUTION ABATEMENT

The Secretary of Health, Education, and Welfare

Washington

In the Matter of the
POLLUTION OF THE INTERSTATE WATERS
Of The
MISSOURI RIVER AND CONNECTING OR TRIBUTARY WATERS IN
OR ADJACENT TO THE KANSAS CITIES METROPOLITAN AREA

NOTICE

There is attached hereto, and made a part hereof, the Findings, Conclusions, and Recommendations, dated June 17, 1960, of the Hearing Board, convened pursuant to the provisions of section 8 (e) of the Federal Water Pollution Control Act (33 U.S.C. 466g (e)), which held a public hearing in the matter of pollution of the interstate waters of the Missouri River and other interstate waters connecting therewith or tributary thereto in or adjacent to the Metropolitan area of Kansas City, Kansas; Kansas City, Missouri; North Kansas City, Missouri.

The Board found that the cities of Kansas City, Kansas; Kansas City, Missouri; North Kansas City, Missouri; and the firms named below are discharging sewage, industrial, and other wastes causing or contributing to pollution of interstate waters which endangers the health or welfare of persons in a State other than that in which the discharges originate, by discharges into or reaching the Kansas River; Turkey Creek Sewer or the Missouri River.

In accordance with section 8 of the Federal Water Pollution Control Act, the City of Kansas City, Kansas; the City of Kansas City, Missouri; the City of North Kansas City, Missouri; Fairfax Drainage District of Kansas; Kaw Valley Drainage District of Kansas; and the following named industrial establishments:

Kansas City Stockyards Company
Livestock Exchange Building
1600 Genessee Street
Kansas City, Missouri

Bio-Laboratories, Inc.
50 North 2nd Street
Kansas City, Kansas

National Cylinder Gas Company
1614 State Avenue
Kansas City, Kansas

The National Laboratories Corporation
1721 Baltimore Avenue
Kansas City, Missouri

Phillips Petroleum Company
2029 Fairfax Trafficway
Kansas City, Kansas

Procter & Gamble Manufacturing Company
1900 Kansas Avenue
Kansas City, Kansas

Atchison, Topeka, and Santa Fe
Railroad Company
Fairfax Building
Kansas City, Missouri

Sinclair Refining Company
906 Grand Avenue
Kansas City, Missouri

Swift & Company
10 Berger Avenue
Kansas City, Kansas

Midwest Cold Storage &
Ice Corporation
1101 South 5th Street
Kansas City, Kansas

Buick, Oldsmobile, & Pontiac
Assembly Plant
100 Kindleberger Road
Kansas City, Missouri

are hereby notified and directed to cease and desist from discharging, without proper, adequate and effective treatment, such sewage, industrial, and other wastes into said waters and to secure abatement of such pollution, by the completion and placing into operation of proper, adequate, and effective municipal and industrial sewage and waste collection, treatment and disposal facilities within a reasonable time after January 1, 1963.

I hereby find that compliance with the schedule contained in the Recommendations of such Hearing Board is necessary to constitute action reasonably calculated to secure abatement of such pollution within a reasonable time after January 1, 1963.

Dated: June 30, 1960

/s/ Arthur S. Flemming
Secretary

In the Matter of the
POLLUTION OF THE INTERSTATE WATERS
of the
MISSOURI RIVER AND CONNECTING OR TRIBUTARY WATERS IN
OR ADJACENT TO THE KANSAS CITIES METROPOLITAN AREA

FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS OF THE HEARING BOARD

The matter of the pollution of the interstate waters of the Missouri River and other interstate waters connecting therewith or tributary thereto in or adjacent to the Metropolitan Area of Kansas City, Kansas, and Kansas City, Missouri, came duly on for hearing at Kansas City, Missouri, on the 13th day of June, 1960 at 9:00 o'clock a.m., before the board hereinafter named, appointed therefor by the Secretary of Health, Education, and Welfare, pursuant to the call of the Secretary, dated May 17, 1960, under the provisions of the Federal Water Pollution Control Act and the regulations prescribed thereunder, and upon due notice of said hearing given, issued, and served as provided therein. Said hearing was continued on June 14, 15, 16, and 17, 1960, and was then concluded and adjourned. Said Board consisted of the following named persons:

Chester S. Wilson, Chairman

William C. Salome (representing the State of Kansas)

Freeman R. Johnson (representing the State of Missouri)

Sylvester E. Ridge (representing the United States Department of Commerce)

Blucher A. Poole

John S. Samson

Robert C. Ayers, Executive Secretary

The following appearances were entered:

The Surgeon General of the Public Health Service, United States Department of Health, Education, and Welfare, by Murray Stein, Chief, Interstate Enforcement, Water Supply and Pollution Control; Sidney Edelman, Public Health Division, Office of the General Counsel, Department of Health, Education, and Welfare; and Glen J. Hopkins, Regional Engineer, Public Health Service, Region VI:

Missouri Water Pollution Board, by Jack K. Smith, Executive Secretary;

Kansas State Board of Health, by Dwight F. Metzler, Director, Division of Sanitation;

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City of Kansas City, Missouri, by Richard H. Koenigsdorf, City Counselor and Benjamin F. Powers, Assistant Counselor;

City of Kansas City, Kansas, by Paul F. Mitchum, Mayor, C. W. Brenneisen, Jr., City Attorney, Carl Hodgkinson, Consulting Engineer, and Truman Schlup, Consulting Engineer;

Fairfax Drainage District of Kansas by Clifford Sharp, Consulting Engineer, and B. Steenhaf;

Kaw Valley Drainage District of Kansas, by R. D. White, and Truman Schlup, Consulting Engineer;

Kansas City Stockyards Company, by Jay B. Dillingham, President;

Bio-Laboratories, Inc., by J. L. Kennedy and Dale Kennedy and by Ralph McKee;

National Cylinder Gas Company, by L. J. Roper, District Manager, R. H. Black, and Ludwig Zengeler, Vice-President;

National Laboratories Corporation, by M. F. Wallace, President;

Phillips Petroleum Company by Reed R. Parker, and Martin E. McMann, Engineering Department, Bartlesville, Oklahoma;

Procter & Gamble Manufacturing Company by Ralph C. Peterson, Chemical Engineer;

Atchison, Topeka, and Santa Fe Railroad Company by J. B. Reeves, Attorney, and C. H. Sandberg, Chief Engineer;

Sinclair Refining Company, by William N. Smith, Terminal Manager;

Swift & Company, by William B. Elson, Jr., Attorney and F. W. Sollo;

Midwest Cold Storage & Ice Corporation by W. Irving Moss, Jr., and John Murphy, Attorney;

General Motors Corporation, Buick, Oldsmobile, and Pontiac Assembly Division, by John Murphy, Attorney;

Corn Products Refining Company, by John R. Moberly, Attorney and H. B. Franey;

American Asphalt Roofing Company, by J. R. Humble, Plant Engineer and A. M. Eberle;

City of North Kansas City, Missouri, by Clifford Sharp, Consulting Engineer;

Chevrolet Assembly Plant, Chevrolet-Kansas Division of General Motors Corporation, by John Murphy, Attorney;

Fisher Body Division, Kansas City Plant, General Motors Corporation, by John Murphy, Attorney;

Schenley Distillers, Incorporated, by W. E. Heidler;

Bendix Aviation Corporation by R. R. Griner and Robert T. Foster;

Prier Brass Manufacturing Company, by Henry J. Hodes;

The Ruberoid Company, by A. M. Eberle, General Superintendent and J. R. Humble, Plant Engineer;

Chamber of Commerce, Kansas City, Missouri, by Herbert Wiggs;

Chamber of Commerce, Kansas City, Kansas, by Ralph Bates.

Now, based on the evidence presented at said hearing the Board makes the following findings, conclusions, and recommendations:

FINDINGS OF FACT

1. All the actions of the Surgeon General of the Public Health Service and the Secretary of Health, Education, and Welfare with respect to the matters involved in this proceeding, as prescribed by the Federal Water Pollution Control Act, were performed and completed prior to the holding of the hearing.

2. The Missouri River, between a point above and near Kansas City, Kansas, and a point below and near the mouth of the Kansas River, flows in a generally easterly direction, constituting a portion of the boundary between the States of Missouri and Kansas. From said last mentioned point said river continues to flow in a generally easterly direction through the State of Missouri to its junction with the Mississippi River. Turkey Creek, including that portion thereof which is now covered and used as a sewer together with the watercourse above and flowing into said covered portion, arises in the State of Kansas, flows in a generally northeasterly direction into the State of Missouri, and thence in a northwesterly and westerly direction into and through the State of Kansas to the junction of said creek with the Kansas River to which said creek is tributary. The Kansas River flows from above said junction in a generally northerly direction through the State of Kansas to the junction of said river with the Missouri River to which said Kansas River is tributary. All of said waters are interstate waters as defined by the Federal Water Pollution Control Act.

3. The City of Kansas City, Kansas, the Fairfax Drainage District of Kansas, the General Motors Corporation, Buick, Oldsmobile, and Pontiac Assembly Division, the Phillips Petroleum Company and each of them have been and now are discharging sewage and industrial and other wastes into said Missouri River, which discharges originate in the State of Kansas, have the effects hereinafter described, and cause and contribute to substantial pollution of the interstate waters of said river in and adjacent to the State of Missouri, which pollution endangers the health and welfare of persons in said state. The City of North Kansas City, Missouri has been and now is discharging sewage and industrial and other wastes into said Missouri River which discharges originate in the State of Missouri, have the effects hereinafter described, and cause and contribute to substantial pollution of the interstate waters of said river in and adjacent to the State of Kansas, which pollution endangers the health and welfare of persons in said State.

4. The City of Kansas City, Kansas, the Kaw Valley Drainage District of Kansas, the Kansas City Stock Yards Company, the Bio-Laboratories, Inc., the National Cylinder Gas Company, the National Laboratories Corporation, the Procter and Gamble Manufacturing Company, the Atchison, Topeka, and Santa Fe Railroad Company, the Sinclair Refining Company, Swift and Company, and the Midwest Cold Storage and Ice Corporation and each of them have been and now are discharging sewage and industrial and other wastes into said Kansas River, thereafter reaching the Missouri River through said Kansas River, which discharges originate in the State of Kansas, have the effects hereinafter described, and cause and contribute to substantial pollution of the interstate

waters of said Missouri River in and adjacent to the State of Missouri, which pollution endangers the health and welfare of persons in said state.

5. The City of Kansas City, Kansas, has been and now is discharging sewage and industrial and other wastes into said Turkey Creek, thereafter reaching said Missouri River through said creek and through said Kansas River, which discharge originates in the State of Kansas, has the effects hereinafter described, and causes and contributes to substantial pollution of the interstate waters of said Missouri River in and adjacent to the State of Missouri, which pollution endangers the health and welfare of persons in said state.

6. The Kansas City Stock Yards Company has been and now is discharging sewage and industrial and other wastes into said Kansas River, thereafter reaching the Missouri River through said Kansas River, which discharge originates in the State of Missouri, has the effects hereinafter described, and causes and contributes to substantial pollution of the interstate waters of said Kansas River and said Missouri River in and adjacent to the State of Kansas, which pollution endangers the health and welfare of persons in said state.

7. The City of Kansas City, Missouri, has been and now is discharging sewage and industrial and other wastes into said Turkey Creek, thereafter reaching the Kansas River through said Turkey Creek and the Missouri River through said Kansas River which discharge originates in the State of Missouri, has the effects hereinafter described, and causes substantial pollution of the waters of said Kansas River and said Missouri River in and adjacent to the State of Kansas, which pollution endangers the health and welfare of persons in said state.

8. The municipalities of Lexington, Glasgow, Boonville, Jefferson City, St. Charles, and St. Louis, and the St. Louis surburban area, respectively, or water utility companies serving the same, use for their public water supplies the waters of said section of the Missouri River below all the discharges aforesaid and are dependent thereon for such supplies. The pollution of said waters from the sources aforesaid causes deterioration of the quality of said waters for the purposes of said public water supplies, in that with said pollution there is continuous danger of introduction into said waters of disease-producing organisms, and in that there are continuously introduced into said waters with said pollution organic substances and compounds in solution or suspension which provide sustenance for and foster the growth and survival of disease-producing organisms in said waters and which impair the taste and odor thereof for drinking and other purposes. Said agencies provide for the treatment of water taken from said river for their public water supplies in order to render the same safe against the transmission of disease and to minimize or eliminate the taste and odor effects aforesaid. By reason of said pollution the degree and cost of such treatment is substantially increased and the danger of transmission of disease in case of failure, breakdown, or negligent or faulty operation of treatment facilities is substantially increased as compared with what would be the case if said pollution were abated.

9. Said waters of the Missouri River hereinbefore described are used for navigation, boating, fishing, swimming, water skiing, and waterfowl hunting. Said waters of the Kansas River hereinbefore described are used for

navigation, boating, fishing, and water skiing. In connection with such uses it is possible for persons engaged therein to contract water-borne diseases from the disease-producing organisms introduced with said pollution, and the use of said water for such purposes is consequently unsafe. All such uses and other beneficial public and private uses of said waters would be promoted and increased if the aforesaid pollution thereof were eliminated or reduced.

10. With the sewage, industrial, and other wastes aforesaid, there are discharged into the waters hereinbefore described human and animal excreta, grease, oil, feathers, and other floating, suspended or dissolved articles or substances of human, animal, or other origin. Some of said articles or substances are offensive and unsightly. Some of said substances cause offensive odors in and about said waters. Some of said substances accumulate on the shores of said waters, and on boats, structures, water intakes, working equipment, fishing gear, and other equipment placed or used in or on said waters, befoulding the same and causing trouble in using the same and keeping the same clean. By reason of the facts aforesaid, the articles and substances discharged into said waters as aforesaid frequently cause nuisances therein. By reason of the pollution of said waters as aforesaid, fish of edible species inhabiting the same are sometimes rendered unpalatable. By reason of the pollution of said waters as aforesaid the development and improvement of various types of property and the operation of various business enterprises adjacent to and related to the use of said waters are hampered and retarded.

11. The effects of the pollution of said Missouri River hereinbefore described extend from the points where the discharges of sewage and industrial and other wastes aforesaid enter said river to the junction of said river with the Mississippi River and beyond.

12. If the sewage and industrial and other wastes discharged into said waters as aforesaid were properly, adequately, and effectively controlled and treated, the aforesaid pollution of said waters would be substantially abated and said waters would be substantially restored and improved for the uses and purposes hereinbefore described.

13. Certain of the municipalities and industries hereinbefore named as discharging sewage and industrial and other wastes into the waters hereinbefore described have in good faith manifested an intention to take steps toward abatement of the aforesaid pollution. Nevertheless effective progress toward abatement of said pollution is not being made by any of said municipalities or industries named as discharging sewage and industrial and other wastes into said waters.

14. Effective, feasible, and reasonable methods for the control and treatment of said sewage and industrial and other wastes are available to each and all of said municipalities and industries hereinbefore named as discharging the same into the waters hereinbefore described. The installation and use of facilities for such control and treatment by said municipalities and industries and each of them are reasonable and equitable measures to abate the pollution of said waters as hereinbefore described. A reasonable time therefor is as stated in the recommendations hereinafter set forth.

CONCLUSIONS

The City of Kansas City, Missouri, the City of Kansas City, Kansas, the City of North Kansas City, Missouri, the Fairfax Drainage District of Kansas, the Kaw Valley Drainage District of Kansas, and the firms or industries hereinbefore named as discharging sewage and industrial and other wastes into the waters hereinbefore described should be required to cease and desist from discharging such sewage and industrial and other wastes into said waters, either directly or indirectly, without proper, adequate, and effective control and treatment, and should be required to provide such control and treatment of such sewage and industrial and other wastes before discharging the same into said waters, so as to abate the pollution hereinbefore described, in accordance with the following recommendations.

RECOMMENDATIONS

It is recommended as follows:

1. That the City of Kansas City, Missouri, the City of Kansas City, Kansas, the City of North Kansas City, Missouri, the Fairfax Drainage District of Kansas, the Kaw Valley Drainage District of Kansas, and the firms or industries hereinbefore named as now discharging sewage and industrial and other wastes into the waters hereinbefore described construct and place in operation such proper, adequate, and effective municipal and industrial sewage and waste collection, treatment, and disposal facilities as will be necessary to abate the pollution of the interstate waters hereinbefore described in accordance with the schedule hereinafter set forth.

2. On or before November 15, 1960, each such firm or industry desiring to be served by the public sewerage system of the appropriate municipality shall advise such municipality of the volume and character of sewage and industrial and other wastes it proposes to discharge to the public system. Should any such firm or industry not desire to be served by such public system, it shall advise such municipality of its desire to be so served on or before the same date.

3. On or before May 1, 1961, each municipality hereinbefore named shall complete the arrangements for the financing of the remedial facilities hereinbefore described.

4. On or before May 1, 1961, each municipality hereinbefore named shall, in writing, instruct its engineer to proceed with final plans and specifications for proper, adequate, and effective treatment facilities for the sewage and industrial and other wastes to be disposed of through its public system. If such action is not taken by any such municipality, or if such instruction does not provide for service to any industry referred to in Paragraph 1 hereof, each such industry shall initiate detailed planning for its own remedial facilities not later than May 31, 1961.

5. On or before July 1, 1962, final plans and specifications for all such remedial facilities shall be completed and submitted to the state water pollution control agency having jurisdiction for review and approval.

6. On or before January 1, 1963, all such remedial facilities shall be placed under contract for construction, to be completed and placed in operation within a reasonable time.

7. Within 15 days after each date established in this schedule, each municipality and each firm or industry concerned shall advise the Regional Engineer, Region VI, U. S. Public Health Service, as to progress toward compliance with each step of this schedule applicable to it.

Respectfully submitted

In the name of the

HEARING BOARD IN THE MATTER OF
POLLUTION OF THE INTERSTATE WATERS
OF THE MISSOURI RIVER AND CONNECTING
OR TRIBUTARY WATERS IN OR ADJACENT TO
THE KANSAS CITIES METROPOLITAN AREA

By

/s/ Chester S. Wilson
Chester S. Wilson, Chairman

ATTEST:

/s/ Robert C. Ayers
Robert C. Ayers, Executive Secretary
Date: June 17, 1960